

DOCUMENT RESUME

ED 337 763

CS 010 740

AUTHOR Andrews, Louise Parcell
TITLE The Use of Reading Study Guides To Enhance the Readability of High School Biology Texts.
PUB DATE Jun 91
NOTE 129p.; M.S. Practicum, Nova University. Best copy available.
PUB TYPE Dissertations/Theses - Practicum Papers (043)
EDRS PRICE MF01/PC06 Plus Postage.
DESCRIPTORS *Biology; *Content Area Reading; Educational Research; Grade 10; High Schools; *Instructional Effectiveness; *Readability; Reading Achievement; Reading Assignments; School Surveys; *Science Instruction; Secondary School Science; *Study Guides
IDENTIFIERS Student Surveys

ABSTRACT

A survey was administered to 10th-grade regular biology students to diagnose the cause for low achievement on chapter tests. Survey results verified teacher suspicion that students did not read textbook assignments when designated as homework and, as a consequence, this deficiency contributed to low achievement scores. A treatment included requiring additional homework in the form of a teacher-prepared Reading Study Guide (RSG) that accompanied each chapter and had to be completed while students read the assignment. To complete the individualized RSG, students were unable to skim the material but, instead, had to read the assignment thoroughly. Upon completion of the RSG, a pretest was administered and learning activities relative to the chapter objectives were presented, followed by a posttest. Cloze test results indicated improvement in student ability levels. Posttest scores increased significantly and the overall grade average on the RSG surpassed expectations. During treatment, cloze test results disclosed that student ability levels were not equivalent to reading stanine levels. Overall results provided evidence that Reading Study Guides were an excellent resource when used with students who have the potential to improve learning skills and increase achievement levels. The RSG treatment was successful as it highlighted course objectives, outlined important concepts and information, was used to study for tests, and encouraged students to read homework assignments. (Twenty-six tables and 2 figures of data are included; 18 references, survey instruments, a sample cloze test, a sample reading study guide, and 29 appendixes of data are attached.) (Author/RS)

* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *

ED337763

THE USE OF READING STUDY GUIDES TO ENHANCE
THE READABILITY OF HIGH SCHOOL BIOLOGY TEXTS

BY

LOUISE PARCELL ANDREWS

A Practicum Report

Submitted to the Faculty of the Center for the Advancement of
Education at Nova University in partial fulfillment of the
requirements for the degree of Master of Science.

This abstract of this report may be placed in a National
Database System for reference.

"PERMISSION TO REPRODUCE THIS
MATERIAL HAS BEEN GRANTED BY

Louise Parcell
Andrews

June/1991

BEST COPY AVAILABLE

TO THE EDUCATIONAL RESOURCES
INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION
CENTER (ERIC)

☒ This document has been reproduced as
received from the person or organization
originating it.

☐ Minor changes have been made to improve
reproduction quality.

• Points of view or opinions stated in this docu-
ment do not necessarily represent official
OERI position or policy.

CS010740

Abstract

The Use of Reading Study Guides to Enhance the Readability of High School Biology Texts.

Andrews, Louise P., 1991: Practicum Report, Nova University, The Center for the Advancement of Education.

Descriptors: Biology/Content Area Reading/Critical Reading/ High Schools/Increase Reading Skills/Programmed Instructional Materials/Reading/Reading Assignments/Reading Comprehension/Reading in Content Area-Biology/Reading Study Guides/Reading Study Skills/Science Curriculum/Science Education/Secondary Education/Study Guides/

A survey was administered to tenth grade regular biology students to diagnose the cause for low achievement on chapter tests. Survey results verified teacher suspicion that students did not read textbook assignments when designated as homework and, as a consequence, this deficiency contributed to low achievement scores. A treatment included requiring additional homework in the form of a teacher prepared Reading Study Guide that accompanied each chapter and had to be completed while students read the assignment. To complete the individualized Reading Study Guide, students were unable to skim text material but, instead, had to read the assignment thoroughly. Upon completion of the RSG, a pretest was administered and learning activities relative to the chapter objectives were presented, followed by a posttest. Cloze test results indicated improvement in student ability levels. Posttest scores increased significantly and the overall grade average on the RSG surpassed expectations. During treatment, Cloze test results disclosed that student ability levels were not equivalent to reading stanine levels. Final statistics confirmed that students did not meet achievement levels commensurate with individual reading stanines. Overall results provided evidence that Reading Study Guides were an excellent resource when used with students who have the potential to improve learning skills and increase achievement levels. The RSG treatment was successful as it highlighted course objectives, outlined important concepts and information, was used as notes to study for tests and encouraged students to read homework assignments. Appendices include surveys, pre and posttests, a sample Cloze test, a sample Reading Study Guide, standard deviation statistics and student data.

Table of Contents

Title Page.....	1
Abstract.....	11
Chapters	
I. Purpose.....	1
II. Research and Solution Strategy.....	10
III. Methodology.....	18
IV. Results.....	27
V. Recommendation.....	48
Reference List.....	50
Appendices	
Appendix A: Student Survey, Science Reading Assignments...	53
Appendix B: Teacher Survey, Science Reading Assignments...	56
Appendix C: Pre and Posttest Results - Period 2.....	59
Appendix D: Pre and Posttest Results - Period 3.....	61
Appendix E: Pre and Posttest Results - Period 6.....	63
Appendix F: Pre and Posttest Results - Period 8.....	65
Appendix G: Sample Cloze Test - Chapter 34.....	67
Appendix H: RSG Treatment Statistics - Chapter 34.....	69
Appendix I: Sample RSG - Chapter 34.....	71
Appendix J: Pretest - Chapter 34.....	74

Appendix K: RSG - Chapter 34, Answers Displayed for Overhead Projection.....	77
Appendix L: Posttest - Chapter 34.....	79
Appendix M: Summary of Cloze Test Results by Reading Stanine-Chapters 34, 35, 36, 38.....	82
Appendix N: Comparison of Textbook and RSG Cloze Tests...	84
Appendix O: Comparison of NonTechnical and Technical Reading Passages-Chapters 34, 35, 36, 38...	86
Appendix P: Comparison of NonTechnical and Technical Cloze Passages-Chapters 34, 35, 36, 38.....	88
Appendix Q: Summary of Cloze Test Results by Ability Level-Chapters 34, 35, 36, 38.....	90
Appendix R: Standard Deviation and Other Computations, Chapter 30.....	92
Appendix S: Standard Deviation and Other Computations, Chapter 31.....	94
Appendix T: Standard Deviation and Other Computations, Chapter 32.....	96
Appendix U: Standard Deviation and Other Computations, Chapter 33.....	98
Appendix V: Standard Deviation and Other Computations, Chapter 34.....	100
Appendix W: Standard Deviation and Other Computations, Chapter 35.....	102
Appendix X: Standard Deviation and Other Computations, Chapter 36.....	104
Appendix Y: Standard Deviation and Other Computations, Chapter 38.....	106
Appendix Z: RSG Statistics - Chapters 30 - 33.....	108
Appendix AA: RSG Statistics - Chapter 34.....	110
Appendix BB: RSG Statistics - Chapter 35.....	112

Appendix CC: RSG Statistics - Chapter 36.....	114
Appendix DD: RSG Statistics - Chapter 38.....	116
Appendix EE: RSG Achievement Level - Pretest and Post- test Results.....	118
Appendix FF: RSG Achievement Level and Reading Stanines.....	120
Appendix GG: Pretest and Posttest Achievement Levels and Reading Stanines.....	122

CHAPTER I

Purpose

The setting for the practicum was a senior high school located in an unincorporated area adjacent to a major city which served a multi-ethnic community, comprised of a majority of White non-Hispanic and Hispanic population. The school boundaries reflected a residential community which included single family homes, apartments, townhouses, rental units and condominiums. There was a large Hispanic community and, also, many people from the Far East, Carribean, Europe and other areas. The community was suburban and had access to a leading community college, two universities, theaters, museums, galleries, a national park, other parks and a plethora of shopping centers. A rapid transit system and commuter bus service connected the suburban community with a large metropolis. During the past ten years, population growth changed the community from a sparsely populated setting to a densely populated and ethnically diverse suburban community.

The socio-economic background of the student body reflected a middle class community in which 39 percent of the parents made a combined income between \$20,000 and \$40,000. Forty-two percent of the parent population was engaged in managerial and professional occupations. The highest level of academic achievement for the parent population was as follows: high school - 28 percent,

bachelor's degree - 38 percent and advanced degrees - 25 percent.

Overall enrollment for students of all grades, both male and female, increased every year. Population increased during the past five years to add approximately 1,000 students to the total school enrollment, making it the largest three year high school in the state. Population growth was expected to continue increasing at a comparable rate in the future. The public high school served a feeder pattern which consisted of three middle and seven elementary schools. There were approximately 9,600 elementary and 10,974 secondary students who lived in the community and were scheduled to attend the high school.

In the past five years, the high school's ethnic composition changed from a predominately 53 percent White population to a predominately 57.4 percent Hispanic majority. The Black population increased from less than one percent to five and one-third percent. The changing composition of the school population indicated a trend toward a tri-ethnic community. The significant increase in the Hispanic composition of the school population required special programs to alleviate language and cultural barriers found in the school and community.

There was an unusually high percentage of students who were over age for their assigned grade level. Thirty-eight percent of the tenth grade students were 16 years of age or older. Eleven percent of the tenth graders were 17 years of age and older. Twenty-six percent of the eleventh graders were 17 years of age and

older with the average age being 16. Nine percent were 18 years of age and older. Twenty-two percent of the twelfth graders were 18 years of age and over with the average age being 17.

Several factors existed withing the community which required an explanation regarding over age students for their respective grade levels. Almost 60 percent of the population were immigrants from Cuba, Nicaragua, Columbia, Venezuela, Peru and Jamaica. Many spoke little or no English when entering the local school system. As a result, students were often retained in elementary school until enough English skills were acquired to function adequately in school. Both junior and senior high school students often failed because of the lack of English skills. The community was very transcient as people moved often. And consequently, numerous school changes often led to failure for students. In addition, many students worked to help support newly arrived immigrants who were dependent upon relatives within the extended family.

Students who withdrew from the regular school program prior to graduation completed an exit interview for career, education and placement needs with a school Occupational Placement Specialist. The majority of students withdrawn were positively placed. A considerable percentage of the students withdrawn from the school were on student visa. Accurate follow-up information on these students was difficult, if not impossible, to obtain since many of these students returned to countries in which the schools did not request academic records from the United States. The withdrawal

rates for the various ethnic, racial and cultural groups during the 1988-1989 school years were as follows: White withdrawal rate - eight and one-third percent, Hispanic withdrawal rate - nine and one-third percent and Black withdrawal rate - 12.1 percent. When compared to the district, state and national averages, the withdrawal rate at the high school was low although the "at risk" population was consistently high.

Due to family instability, statistics indicated a need for more counseling services from both outside sources and from the school. According to a survey, the family unit of the student population was structured as follows: 65 percent lived with both parents, 24 percent lived with the mother, five percent lived with the father, four percent lived with legal guardians and one percent lived alone.

The classroom setting for the practicum was a tenth grade general biology class. For most students, it was their first year in high school and ages ranged from 14 to 17 years. Reading stanines for students in these classes ranged from four to nine and student ability was average or above average. Due to the political and economic situation in Central America and the Caribbean, more than half of the student population were immigrants. For most foreign born students, the English language was their second language. Although fluent speakers, many students were not proficient in writing or reading English and, as did their native counterparts, experienced difficulty in comprehending the language of science.

Additionally, the high school was severely overcrowded as the original building and 30 portable classrooms housed a school population of 3,616 students at 150 percent capacity. Two hundred six instructors were employed to meet academic requirements for student graduation. Other faculty and staff members scheduled to provide student services were as follows: four assistant principals, 14 custodians, 1 psychologist, 10 counselors, 28 clerical assistants, 1 principal and 1 visiting teacher. The author was a member of the science department in which 20 certified instructors were employed to meet academic requirements in the realm of science. To meet county and state graduation minimum standards, three years of laboratory coursework in science were required.

Due to the overcrowding, a state waiver enabled the scheduling of an eighth period day with class periods 45 minutes in length instead of 50. Students attended seven instructional classes and an eighth period was designated as lunch. This unique scheduling permitted additional student use of classroom space while one-third of the school population attended lunch. Although overcrowded, class size was maintained at a ratio of 30 students per science instructor. Approximately 25 percent of the total school population was bused to school, severely limiting student participation in extra curricular school activities, athletics and after school tutoring.

Although reasons were varied, 24 percent of the total student population maintained some type of part time job outside school

hours. Hours worked were after school, on week nights and on weekends. Most students worked in order to buy clothes, make automobile payments, pay for automobile insurance or to assist single parent families with financial obligations.

The writer of this practicum taught four general biology classes in a class that was extremely well equipped with educational supplies, audiovisuals and laboratory equipment. The classroom was approximately 30 feet by 40 feet and was designed for class discussion with 35 desk chairs in the front half of the room and 32 laboratory stations in the back half of the classroom. Lab stations consisted of a deep utility sink, book holders, individual stools, electrical outlets, gas jets and black top surfaces on which to work. Both walls of the laboratory area were designed as a work area and contained upper and lower storage cabinets. Three additional deep utility sinks further augmented the facility. Air temperature was well controlled by a central air conditioning and heat unit.

Whenever scheduled by the teacher, a television studio provided access to closed circuit science video programs. A four dollar laboratory or science breakage fee was charged to all students in order to purchase and replace broken glassware. As a result, equipment was readily available for all kinds of laboratory activities. Twenty monocular microscopes, sixteen binocular stereomicroscopes and a refrigerator were maintained in the classroom. During each of the past five years, the state legislature provided \$5,000 to \$10,000 in additional funds for the purchase

of high cost science equipment. Items purchased for individual classroom use included the following: Apple IIe computer with Imagewriter printer, a plant mobile, plant and animal chart, demoscope, electronic balance, microscope cart, hydroponic station, terrarium, 35 gallon salt water aquarium and several fresh water aquariums.

The writer of this practicum was fortunate to teach in such an outstanding science facility and work with polite, friendly and pleasant students. Most students were very eager to learn and wanted to please their parents by succeeding in school. However, many general biology students were hindered from learning by many of the same disadvantages as those students who resided in and attended inner city schools. Students anticipated the school year with high expectations and it was distressful to observe such enthusiams want because text material and course content was beyond their grasp.

The students who contributed statistics for this practicum reiterated that science was a difficult field of study because its success or mastery was based upon an analagous comparison to some previous knowledge. The science was difficult as it included both content and the process by which students used critical thinking skills to solve problems. Many educators agreed that problem solving skills learned in science were applicable in resolving problems throughout one's lifetime. The primary method for obtaining prior science knowledge was through reading. However,

according to a student survey, only 28 percent of the regular biology students read textbook assignments when designated as homework. The survey confirmed teacher observation with regard to student's above average ability coupled with low student performance (Appendix A:53).

Other variables also affected student performance in biology. As a result of shorter class periods, the diversity of student cultures and added responsibilities, students had limited time to complete school assignments. While trying to maintain a part time job which demanded more than 20 hours of outside school time and a seven period class schedule, students deleted nonwritten homework assignments and concentrated on written assignments as one maintain academic requirements (Appendix B:56). It was expected that 60 percent of the students in regular biology read textbook assignments when designated as homework. A discrepancy existed whereby 32 percent of the biology students were not motivated to read textbook assignments outside class time.

A review of the literature suggested that the problem may not be limited to finding time to read but might have been a direct result of the nature of scientific writing, hence, a textbook for student use with a higher reading level than intended. If this situation existed, then instructors had to devise a method by which 32 percent of the biology students would become motivated to read textbook assignments outside class time. Teachers had to intervene in order to improve the ability of students to comprehend the gist of biology textbook materials. The target group consisted of a

class of general biology students considered to be of average ability and whose primary objective was to pass biology as part of graduation requirements. Through intervention procedures explained later in this practicum and completion of the treatment, outcome objectives were as follows:

1. After ten weeks, 60 percent of the tenth grade regular biology students, upon completion of teacher prepared Reading Study Guides and classwork relative to the subject matter will score 10 - 30 percent higher on a teacher prepared posttest.
2. After ten weeks, 60 percent of the tenth grade regular biology students, upon completion of teacher prepared Reading Study Guides will score 75 percent or higher on a teacher prepared Reading Study Guide.
3. By the tenth week, each tenth grade regular biology student, upon completion of the RSG treatment will achieve scores on the RSG, pretest and posttest were commensurate with individual student reading stanines.

CHAPTER II

Research and Solution Strategy

As science and technology forge new frontiers, the study of science is viewed as an important prerequisite for an increasing number of career options. However, overall student performance in the sciences is not keeping pace with the demand for workers who are both knowledgeable and skilled problem solvers. Among educators, a consensus exists that the student of today does not read text assignments, does not read carefully enough to understand the gist of the assignment and can not remember or apply what was read. A review of the literature reveals many plausible solutions, each one with varying degrees of success.

Science is both the knowledge and process for solving problems. According to Morrison (1980), a student is taught how to read narrative passages in elementary school but does not understand how to apply those skills to expository material in later grades. Activities to apply reading skills are needed at both levels. Schallert and Tierney (1980) reveal that a student exhibits difficulty in selecting main ideas and recalling important ideas. Betkowski and McDonald (1985) disclose that a student does not even process or remember explanations if it conflicts with any preconceived theories about science. Bean, et al (1985)

acknowledges that to remember facts, a student must be able to relate new information to past knowledge as only 30 percent of a study group is able to solve a problem without some kind of hint. As researchers like Shebilske and Rotondo (1981) continue to study how students learn science, it is apparent that the textbook's readability, presentation and layout of information is of great importance.

Shebilske and Rotondo (1981) explain that typographical and spatial clues facilitate learning, help the student to study more efficiently and relate directly to comprehension. The order of presentation in a textbook relates to the amount of student recall and the ability to select main points of a reading assignment. For optimum understanding and comprehension, the textbook format must consist of an idea unit comprised of phrases and sentences that correspond to the gist of the idea unit. Many textbooks contain topic shifts, making it difficult for a student to follow the main idea. It is further noted by Morrison (1980) that whatever the layout in a textbook, only 50 percent of a study group understands the use of transitional words, phrases and clauses in sentences.

As a result of poor reading abilities, the nature of scientific writing and the use of textbooks at a higher reading level than student ability, researchers work to produce a variety of strategies intended to enhance textbook use by the student. Most solutions involve teacher preparation of a worksheet or activity sheet to accompany passages in the textbook. The individ-

ualized worksheet or activity sheet assists the student to assimilate content, identify main ideas and improve critical thinking skills. A review of all available research identifies the following strategies available for teacher use to enhance reading ability and increase use of the textbook: take notes using a three column format, write a preview of the text materials and provide an accompanying guide, produce audio tapes and provide an accompanying activity sheet, simplify word syntax, read passages aloud to class, use guided material and rewrite text material to a lower level that matches student ability.

Prince George's County Public Schools in Maryland (1980) describes a new method for note taking by the student. The page is divided into three columns titled key words, notes and summary. The format is part of the basic study skills curriculum and, as incorporated, proves to be useful as part of a systematic plan and set of activities for learning. Several researchers present similar ideas that involve the writing of text previews and production of accompanying guides. Thelen (1976) describes the logical sequence of events to facilitate learning in science as follows: diagnose, prepare activities, use guided material, provide reinforcement and evaluation. The guided materials are written at three levels and seek information which is literal, interpretive and applied. The Cloze test is used as a screening device to identify students as independent, instructional or frustrational. After implementing the three level guides, student

performance on teacher prepared multiple choice tests were as follows: independent group at the 90 percent achievement level, instructional group at the 75 percent achievement level and the frustrational group at the 40 percent achievement level.

Bean and Ericson (1989) suggest teachers prepare a text preview to include an interest building component as the analogy to bridge past information to new material, a synopsis or overview, an explanation of difficult vocabulary words and written questions to guide the reader. Bechtel and Franzblau (1980) recommend that teachers first assess student reading levels and the reading level of the textbook intended for student use. Part of the prescription is to administer a cloze test as a pretest to determine the suitability of the textbook. Results may indicate the need to prepare special reading exercises, activities or worksheets. Neither of these documents enhance student achievement.

The purpose of research by Samson (1982) is to improve student ability in comprehending the gist of biology textbook materials. For research purposes, students are divided into three groups according to these instructional methods: strategy group, a read-study group and a control group. The strategy group is exposed to eight days of learning how to analyze materials and look for relationships between ideas. The read-study group practices the task of reading short passages. A third group does not receive any special instruction or practice sessions. A pretest, midtest and posttest is administered during the study to determine which method

is most effective. The test results do not support any one method as being most effective. Samson (1982) concludes that educators must design instructional strategies to suit the criterion task and consider individual student differences with regard to the comprehension of biology textbook materials.

Fulton's (1985) objective is to design four different instructional strategies in order to improve analyzing and problem solving skills for students of limited reading abilities. The four instructional strategies are as follows: audio tapes with accompanying activity sheet, activity sheet to help simplify word syntax and define vocabulary words etymologically, teacher read concepts followed by a related class activity and a control group. All groups are administered both a pretest and a posttest. The audio tape group performed best on the pretest. The posttest results indicate group three, teacher read concepts, had the lowest scores whereas group two, simplifying word syntax outperformed all other groups. In both science concepts and reading comprehension, results indicate that student textbooks must be simplified and possibly rewritten with accompanying worksheets.

According to Wright (1982), inadequate student reading ability is one of the two serious problems in grades 7 through 12. Initially, overall goals of the project are to improve reading ability, change the nature of scientific writing and to lower the readability level of science textbooks. The purpose of the study is to investigate the effect on comprehension and biology

achievement when high school students are provided materials written to a lower level of readability than that of the assigned student text. Cloze test results confirm the idea that the student textbook presents serious problems of comprehension as the readability is above the twelfth grade level. Selected passages are both nontechnical (introductory) and technical (scientific in nature). Cloze tests determine which students are assigned to inadequate or adequate comprehension groups. When comparing rewritten passages to original textbook passages, Cloze test scores indicate comprehension levels increase by 12.9 percent on nontechnical passages and 8.2 percent on technical passages for the inadequate comprehension group; adequate comprehension group levels increase 7.7 percent on nontechnical passages and 9.5 percent on technical passages. For students with severe comprehension problems, Cloze test results indicate no significant difference in comprehension between rewritten and original textbook passages. Overall, results do indicate comprehension and biology achievement may increase by more effective use of textbooks as well as making them more readable.

After a diligent study of available research, all of the authors are to be commended upon their unique instructional strategies, program implementation, statistical data and documented results to share with other instructors experiencing similar problems. Although instructional strategies are varied, one problem is mentioned consistently throughout the research. It is suggested that the initial procedure include determining the readability

level of the student textbook. Instead of erroneously assuming students to not want to read, teachers are instructed to conduct a readability test and learn if the textbook is written above the ability level of the respective students. Perhaps students do intend to read the textbook but quickly lose interest as it proves to be too difficult to comprehend and read.

Of all the research surveyed, Wright (1982) appears to have the best solution strategy whereby text passages are rewritten to the ability level of the students. Comprehension and biology achievement test scores indicate the greatest improvement occurs when textbook passages are rewritten to a lower ability level than by any other instructional strategies cited in the literature. Most importantly, rewriting textbook passages assures that all students receive the same treatment. This approach enables the instructor to concentrate on rewriting the text passages for one group rather than compiling new materials and different procedures for several groups. A readable text passage provides students the opportunity for success, improves self esteem and develops a positive attitude toward learning.

Wright's (1982) instructional strategy of rewriting text passages forms the basis for a new modified approach called a Reading Study Guide (RSG). The RSG is a teacher prepared instrument written to a lower ability level to accompany every reading assignment. The student must read the assignment in order to complete the RSG. The document consists of a logical sequence

of questions, fill in the blank statements, definitions, illustrations to label and color, and matching statements. Not only does this new strategy provide readable science passages but the student is required to read the assignment. An RSG attacks several problems and may produce these desired outcomes: identify main ideas of text passage, specify minimum content for success, exercise higher thinking skills and, for study purposes, create chapter notes.

CHAPTER III

Methodology

Identifying Reading Level of the Student Textbook

The publisher of the student textbook, Biology 1986, indicates that the book was written for the average student enrolled in an introductory high school biology course. Therefore, the initial procedure involved determining the readability of the biology textbook. Prior to the assessment, it was noted that the authors' qualifications with regard to writing a high school biology textbook were as follows: three teach at the college level, two teach at the high school level, 12 are content specialists at the doctorate level, six are curriculum specialists and one is a reading specialist. The Fry Readability Graph in slide rule form was used to calculate the approximate reading level of the passages selected. The content of the 100 word passages was technical as it contained new science words in boldface print. The data collected did verify that chapter readability fluctuated according to both content and author. A simple tally of data indicated the average readability was at the 11.4 grade level whereas a complete calculation raised the level to a 12.1 grade level for technical passages in the student textbook. Both readability levels of 11.4 and 12.1 appeared to corroborate teacher suspicion that the textbook was too difficult for most students. While readability levels suggested that the textbook was one or two years above the

grade level for which it was intended, many students had not yet attained the reading skills to even qualify them as reading on grade level. Data collected and used to calculate the approximate reading level of the student textbook is listed in Table 1.

Table 1

A Data Collection of Selected Science Passages for the
Determination of Readability Levels *

Chapter	Topic	Page	Syllables	Sentences	Grade Level
4	Matter	47	165	8.1	11
	Mixtures	53	164	5.6	12
5	Compounds	69	184	8.5	17+
6	Cells	83	182	8.0	17+
	Cells	86	165	7.3	11
7	Transpiration	103	161	5.6	11
9	Cell Division	143	171	7.5	13
12	Transcription	186	142	5.3	8
13	Chromosomes	207	186	7.3	17+
15	Evolution	241	147	5.7	9
24	Plants	357	151	6.3	9
TOTALS:			1818	75.2	125
AVERAGE:			165	6.8	11.4
			FRY READABILITY:		12.1

* Biology, 1986

Identifying Target Students for Reading Study Guide Treatment

At the onset of treatment, a chapter pretest and posttest were administered to all biology classes as a method to determine which class was the most appropriate for study. Chapter pretest and posttests results for chapters 30 and 31 were analyzed and classes for which posttest results identified them as either the most or least improved were eliminated. Any class whose test results

indicated little or no change between the pretest and posttest were the most likely candidates for study. As a result, both periods two and three appeared to be the best candidates for study. Therefore, additional data was needed to select the class best suited for treatment. If past performance was indicative of future performance, it was noted that, as a class, period two was very negligent with regard to completion of homework assignments whereas period three had a much higher completion rate for all assignments. Both the completion rate on assignments and the grades earned on the first Reading Study Guide assigned to all students were the deciding factors as to whom would be the target group. Individual student results on the pretest, posttest and Reading Study Guide assignment for chapters 30 and 31 are listed by class period in the Appendices as two (Appendix C:59), three (Appendix D:61), six (Appendix E:63) and eight (Appendix F:65). A comparison of pretest, posttest and Reading Study Guide results by class period for chapter 30 is listed in Table 2.

Table 2

A Comparison of Pretest, Posttest and Reading Study
Guide Results for Chapter 30 by Class Period

Class	Pretest 30	Posttest 30	Percent Change	RSG
2	49.5%	48.7%	- 0.8%	1.8
3	50.9%	40.9%	- 9.9%	2.3
4	50.4%	44.0%	- 6.4%	3.2
8	52.3%	47.5%	- 4.8%	2.3

A comparison of pretest, posttest and reading study guide results by class period for chapter thirty-one is listed in Table 3. The net change between pretest and posttest results for both chapters 30 and 31 is listed in Table 4.

Table 3

A Comparison of Pretest, Posttest and Reading Study Guide Results for Chapter 31 by Class Period

Class	Pretest 31	Posttest 31	Percent Change	RSG
2	73.2%	75.0%	+ 1.8%	1.7
3	64.4%	77.5%	+13.1%	3.0
6	69.4%	86.4%	+17.0	2.9
8	68.0%	-----	-----	3.3

Table 4

Net Change Between Pretest and Posttest Results for for Chapter 30 and 31 by Class Period

Class	Net Change
2	+ 1.0%
3	+ 3.2%
6	+10.6%
8	---

Identifying Student Ability Levels

Two criteria were used to identify students by ability level. The first criteria involved procedures for administering a Cloze

test to all target students in order to determine which students were working at an independent, instructional or frustrational level. The Cloze test was administered to students using passages from chapter 34 of the student textbook and from the Reading Study Guide treatment provided by the instructor (Appendix G:67). Both resources were divided into nontechnical and technical subject matter. To insure valid test results, the tests were conducted prior to the commencement of lessons for chapter 34. Individual student results were compiled for the target group, period three (Appendix H:69). A summary of the four Cloze test results administered to the target group is listed in Table 5.

Table 5

A Summary of the Four Cloze Test Results for
the Target Group, Chapter 34

Percent of Achievement	Achievement Level	Class Percent (Real)*	Class Percent (Estimation)**
52% & above	Independent	11.1%	17.6%
34% - 51%	Instructional	23.2%	36.8%
33% & below	Frustrational	28.7%	45.6%

* 37% did not produce results for all 4 CLOZE Tests

** Estimation calculated from Real results

The second criteria used to help determine student ability level involved obtaining reading stanines from student records (Appendix Z:108). Other than teacher recommendation and previous science accomplishments, students are placed in science classes

based primarily upon reading stanine levels. A summary of student reading stanines of the target group is listed in Table 6.

Table 6

A Summary of Reading Stanines for the Target Group

Stanine Level	Classification	Class Percent
7, 8, 9	Above average	22.2%
4, 5, 6	Average	66.7%
3	Below average	11.1%

Administering the Reading Study Guide Treatment

After selecting a class for study, all students received the same treatment for nine to ten weeks. The major component of the treatment was a Reading Study Guide (Appendix I:71). It was an individualized guide written by the instructor for students to complete as homework. It was written by the instructor to accompany each chapter in the student textbook. It included questions, fill in the blank statements, definitions, illustrations to label and color, matching statements and any other kind of written activity which best related to the chapter being studied. Wherever appropriate, the RSG was written to incorporate all six levels of Bloom's cognitive objectives. The levels, listed in order of increasing difficulty, were identified as knowledge, comprehension, application, analysis, synthesis and evaluation. The purpose of the RSG was to force students to read assignments in the textbook. The RSG was written in such a way as to make it

impossible for students to skim the reading assignment, looking for answers to questions on the RSG.

Prior to the start of each new chapter, a Cloze test was administered using both the student textbook and teacher prepared RSG as the resource. Both nontechnical and technical passages were tested (Appendix O:86). Next, the reading assignment and timely completion of the RSG was designated as homework (Appendix I:71). The RSG included the biology content for each chapter and referenced both state and county objectives for the course. Before any discussion or activity relative to the assigned chapter began, the RSG was turned in to the instructor for grading and, immediately, a pretest was administered (Appendix J:74). Pretest questions were written directly from each respective RSG. Upon completion of chapter objectives and all relative activity, the instructor graded RSG was returned for correction of wrong answers by each respective student. Correct answers to RSG's were provided by means of the overhead projector (Appendix K:77). Instead of copying any teacher prepared notes, the student corrected RSG served as chapter notes and enabled students to use the RSG as a study guide for the posttest. Upon the completion of each chapter, a posttest was administered (Appendix L:79).

The complete RSG treatment administered to the target group for each chapter is summarized and consisted of the following procedures: a Cloze test of both nontechnical and technical passages from the student textbook, a Cloze test of both nontechnical and technical passages from the teacher prepared RSG, the RSG

treatment assigned as homework, the collection of the RSG homework assignment, a pretest referenced to the respective RSG, class discussion and activity work relative to chapter objectives, the teacher correction of the RSG, the return of the RSG to students for correction of wrong answers and a posttest, identical to the pretest.

Data Collection Procedures

Assessment Instrument

Data Collection Procedures

Fry Test

1. Selected technical passage to determine readability level of textbook.

Pretest Chapter 30, 31
RSG Treatment
Posttest Chapter 30, 31

2. Administered pretest, RSG and posttest for Chapter 30 and 31 to identify target students.

Pretest 32, 33
RSG Treatment
Posttest Chapter 32, 33

3. Administered pretest, RSG and posttest for Chapters 32 and 33 to collect additional data for analysis.

Stanford Achievement
Test

4. Obtained Reading Stanines of target group from student records for grouping by ability levels.

Initial Cloze Test

5. Administered Cloze Test to identify ability levels of target students as independent, instructional or frustrational.

Cloze Test, Textbook
Reference

6. Administered Cloze Test to identify changes in ability level.

Cloze Test, RSG

7. Administered Cloze Test to compare results of RSG to textbook Cloze Test.

RSG Treatment

8. Assigned RSG Treatment as homework to force students to read textbook assignment, RSG collected for grading.

Pretest of Chapter

9. Administered Pretest of chapter to obtain data for analysis of RSG Treatment.

(continued)

Assessment Instrument	Data Collection Procedures
RSG as Chapter Notes	10. RSG returned and students corrected wrong answers.
Posttest of Chapter	11. Administered Posttest of Chapter for comparison to Pretest results.

Practicum Monitoring During Implementation

Date	Activity	Monitoring Procedures	Class Time	
			Weekly	Daily
Jan 1990	Identify Reading Level of Textbook	Fry Test	teacher activity	---
March 19-23	Identify Target Students	Pretest & Posttest, Chapter 30	40 min	8 min
March 26-30	Identify Target Students	Pretest & Posttest, Chapter 31	40 min	12 min
April 2-5	Administer RSG Treatment, Collect Data	Pretest, RSG and Posttest, Chapter 32	60 min	12 min
April 16-20	Administer RSG Treatment, Collect Data	Pretest, RSG and Posttest, Chapter 33	60 min	20 min
April 23-27	Identify Ability Levels	Cloze Test	20 min	10 min
April 23 - May 3	Administer RSG Treatment, Chapter 34	Text Cloze Test RSG Cloze Test RSG Pretest Student correct Posttest	15 min 15 min (at home) 20 min 10 min 20 min	10 min
May 3-11	Administer RSG Treatment, Chapter 35	Text Cloze Test RSG Cloze Test RSG Pretest Student correct Posttest	15 min 15 min (at home) 25 min 10 min 25 min	13 min

(continued)

Date	Activity	Monitoring Procedures	Class Time	
			Weekly	Daily
May 14-25	Administer RSG Treatment, Chapter 36	Text Cloze Test	15 min	9 min
		RSG Cloze Test	15 min	
		RSG	(at home)	
		Pretest	25 min	
		Student Correct	12 min	
		Posttest	25 min	
May 28 - June 8	Administer RSG Treatment, Chapter 38	Text Cloze Test	15 min	10 min
		RSG Cloze Test	15 min	
		RSG	(at home)	
		Pretest	25 min	
		Student Correct	10 min	
		Posttest	25 min	

CHAPTER IV

Results

After ten weeks, all statistical data was analyzed to determine the effectiveness of the Reading Study Guide treatment on chapter pretest and posttest results. Cloze tests were administered throughout the program to reveal any improvement in student ability between frustrational, instructional and independent levels. Student reading stanines were correlated with Cloze test results to either corroborate results or identify any discrepancies. Individual student records were maintained throughout the RSG treatment for each chapter. This included pretest, posttest, Cloze test results of both technical and nontechnical passages, Cloze test results of chapter RSG and student achievement on each chapter RSG. Upon completion of the treatment, a final analysis was made with regard to summarizing individual student progress, grouping and summarizing results according to the three student ability levels and overall student achievement. A final analysis was made with regard to each of the outcome objectives.

Cloze Test Results and Student Ability Levels

In order to properly evaluate the RSG treatment, several bits of data were considered to substantiate and verify results. First, Cloze test results were compared to reading stanines as this verified the accuracy of reading stanine test scores and enabled

the investigator to determine ability levels of each student (Appendix M:82). A brief summary is listed in Table 7.

Table 7
Cloze Test Results by Reading Stanine

Reading Stanine	Number of Students	Chapter 34	Chapter 35	Chapter 36	Chapter 38
8	3	40.1%	39.2%	49.8%	56.6%
7	4	33.5%	34.0%	44.9%	44.7%
6	4	26.0%	32.0%	38.0%	34.3%
5	9	40.0%	28.9%	44.7%	38.9%
4	4	31.7%	37.8%	41.1%	39.0%
3	3	17.0%	--	40.6%	51.3%
Average (weighted)		34.5%	33.5%	42.0%	41.3%

When student ability levels as determined by Cloze test results were compared to reading stanine levels, a discrepancy existed. Student ability levels did not match reading stanines. A comparison of the Cloze test results between the textbook and teacher prepared Reading Study Guide was analyzed (Appendix N:84). The percent of correct responses did not vary between the textbook and RSG. A summary of the comparison is listed in Table 8.

Table 8
A Comparison of Cloze Test Results between Textbook and RSG

Reading Level	Chapter	Textbook	RSG
7.0	34	34.0%	34.5%
6.5	35	33.0%	33.5%
8.0	36	43.0%	43.5%
7.0	38	41.0%	41.5%
35			

These results indicated that both the textbook and RSG were equivalent in that one was not more difficult than the other. The RSG was a concise summary of pertinent information relative to each chapter and was originally intended to simplify and consolidate textbook content. It was hoped that Cloze test results on the RSG would be higher than the textbook. However, overall results did not validate this point.

Additionally, a comparison of Cloze test results was conducted to compare differences in readability between NonTechnical and Technical passages (Appendix O:86) of textbook and RSG treatment (Appendix P:88). A summary of the comparison is listed in Table 9.

Table 9

A Comparison of Cloze Test Results Between
NonTechnical and Technical Passages

Chapter	NonTechnical	Technical	Overall Average
34	30.9%	37.5%	34.3%
35	36.1%	31.0%	33.5%
36	48.5%	33.0%	43.2%
38	48.8%	34.3%	41.5%

The results listed in Table 9 verified expectations that Technical passages were more difficult than NonTechnical passages. However, the Technical passages were only slightly more difficult. Overall results are illustrated in Figure 1.

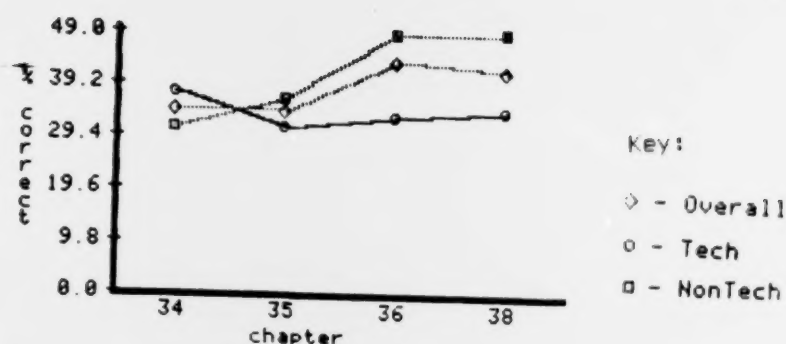


Figure 1

Cloze Test Results

A study of Figure 1 indicated that students steadily improved their ability levels. As Cloze test results indicated, the class averaged changed from slightly above the frustrational range of ability to high end of the instructional ability level. As a result of Cloze test and subsequent interpretations, students were placed into groups according to ability level instead of by reading stanine. All Cloze test results were transposed from reading stanines into groups according to ability level (Appendix Q:90). A summary of student ability level is listed in Table 10.

Table 10

Grouping of Students According to Ability Level

Level	Chapter 34	Chapter 35	Chapter 36	Chapter 37	Average
Independent	20.4%	24.7%	42.3%	45.3%	30.2%
Instructional	33.8%	27.5%	33.3%	17.8%	14.8%
Frustrated	45.6%	47.8%	20.6%	36.9%	43.5%

The actual number of students at each ability level is listed in Table 11.

Table 11
Number of Students Grouped at each Ability Level

Level	Chapter 34	Chapter 35	Chapter 36	Chapter 38	Average
Independent	5.5	6.7	8.0	12.3	8.2
Instructional	9.1	7.4	11.3	4.8	4.0
Frustrated	12.3	12.9	3.0	9.9	11.7

At the end of ten weeks of treatment, Cloze test statistics indicated an overall improvement in student ability levels. Throughout the treatment student ability levels changed. Some of the instructional level students moved into the independent level. By the end of the treatment, two students at the frustrational level moved into the instructional level and seven students at the instructional level moved into the independent level. Fortunately, the reading level for chapters 34, 35, 36 and 38 did not fluctuate and ranged between 6.5 and 9.0, thereby, validating the change in ability levels. One goal was achieved in that overall student ability levels changed as a total of nine students moved up to a higher ability. When illustrated, as in Figure 2, the improvement in student ability was much more apparent.

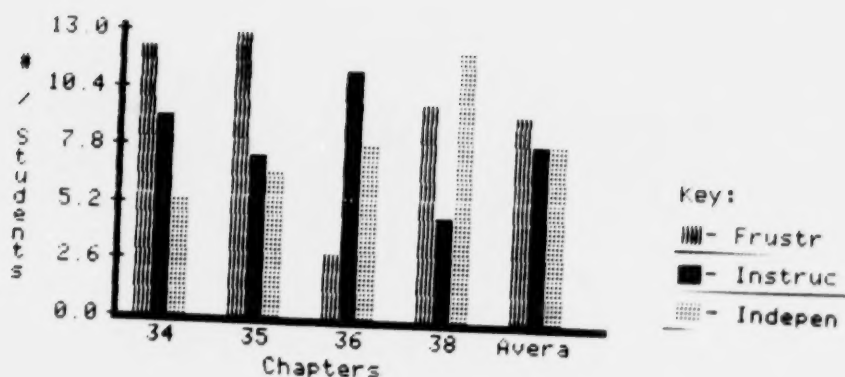


Figure 2

Student Ability Levels

Outcome Objective 1: After ten weeks, 60 percent of the tenth grade regular biology students, upon completion of the teacher prepared Reading Study Guides and classwork relative to the subject matter will score 10 - 30 percent higher on a teacher prepared posttest.

Students who participated in the RSG Treatment were each given a pre and posttest for chapters 31 through 38, excepting chapter 37. The pretest was administered upon students' completion of the RSG. Next, the instructor conducted all prescribed learning activities relative to the chapter. Subsequent to the learning activities, the posttest was administered. Questions on the pretest and posttest were identical. All numerical data for each chapter was recorded and tabulated for the purpose of calculating the statistical significance of the posttest results (Appendix R:92 through Appendix Y:104). A summary of the posttest results for the target group appears in Table 12.

Table 12

Chapter Summary of Posttest Results for Target Group

Chapters:	30	31	32	33	34	35	36	38
Mean	48.0%	77.9%	54.4%	59.4%	75.4%	56.5%	48.0%	74.3%
Median	50.0%	74.0%	54.0%	59.0%	68.0%	60.0%	46.0%	64.0%
Mode	30.0%	74.0%	68.0%	59.0%	76.0%	72.0%	40.0%	64.0%
Reading Level	8.0	9.0	8.0	9.0	7.0	6.5	8.0	7.0

A summary of the data used to calculate the statistical significance of posttest results and subsequence analysis is listed in Table 13.

Table 13

Standard Deviation and Statistical Significance of Posttest
Results of Target Group

Chapter	Test	Mean	Median	Mode	S.D.	Level	Posttest Significance
30	Pre	10.32	9.0	8.0	3.02	.26	NO
	Post	9.54	10.0	8.0	2.79	.28	
31	Pre	13.12	13.0	13.0	4.44	1.13	YES
	Post	18.14	17.0	17.0	3.00	5.01	
32	Pre	12.28	13.0	14.0	3.87	.34	YES
	Post	13.60	14.0	17.0	3.39	.39	
33	Pre	6.96	7.0	7.0	1.73	.12	NO
	Post	7.16	7.0	7.0	1.80	.11	
34	Pre	15.04	16.5	16.0	4.93	.01	NO
	Post	15.08	17.0	16.0	4.49	.01	
35	Pre	13.18	13.5	12.0	3.46	.27	NO
	Post	14.12	15.0	18.0	4.39	.21	
36	Pre	7.82	7.5	6.0	2.57	.07	NO
	Post	8.0	8.0	7.0	2.43	.07	
38	Pre	12.59	13.0	13.0	3.03	.75	YES
	Post	14.86	15.0	15.0	4.32	.52	

The chapters for which the posttest score varied little from the pretest score indicated no significance. However, when posttest scores improved considerably from the pretest score, results were of significance. Calculations indicated that posttest results were significant at a rate of 37.4 percent. For complete understanding of Table 12, the results and analysis of statistical significance was converted to percent in Table 14.

Table 14

Percentage Scores for Pretest and Posttest Results

Chapter	Test	Mean	Median	Mode	Significant Results
30	Pre	52%	45%	40%	NO
	Post	48%	50%	40%	
31	Pre	57%	56%	56%	YES
	Post	78%	73%	73%	
32	Pre	49%	52%	69%	YES
	Post	55%	56%	68%	
33	Pre	58%	58%	58%	NO
	Post	59%	58%	58%	
34	Pre	75%	82%	80%	NO
	Post	75%	85%	80%	
35	Pre	52%	54%	48%	NO
	Post	56%	60%	72%	
36	Pre	47%	45%	36%	NO
	Post	48%	48%	42%	
38	Pre	63%	65%	65%	YES
	Post	74%	75%	75%	

A tabulation of posttest achievement levels for the entire target group indicated that the mean average increased by almost 30 percent. The top 60 percent of the target group performed at the same rate. The posttest achievement levels for the target group is compiled in Table 15 (Appendix F:92 through Appendix Y:106).

Table 15

Posttest Achievement Level of Target Group

Chapter	Mean	Median	Mode	Completion Rate
30	48.0%	50.0%	50.0%	96.3%
31	77.9%	74.0%	74.0%	81.5%
32	54.4%	54.0%	68.0%	92.6%
33	59.4%	59.0%	59.0%	92.6%
34	75.4%	68.0%	76.0%	92.6%
35	56.5%	60.0%	72.0%	92.9%
36	48.0%	46.0%	40.0%	88.9%
38	74.3%	64.0%	64.0%	77.8%

Scores for the top 60 percent of the target group is compiled in Table 16 (Appendix R:92 through Appendix Y:106).

Table 16

Posttest Achievement Level for
60 Percent of Target Group

Chapter	Number of Students	Mean	Median	Mode
30	15.6	56.9%	55.0%	50.0%
31	13.2	87.8%	87.0%	83.0%
32	15.0	63.6%	64.0%	68.0%
33	15.0	69.2%	67.0%	59.0%
34	15.0	76.8%	76.0%	76.0%
35	15.0	68.8%	72.0%	72.0%
36	14.4	55.2%	52.0%	52.0%
38	12.6	74.5%	72.0%	64.0%

Posttest scores for the entire target group and the top 60 percent are compared in Table 17.

Table 17

A Comparison of Posttest Scores at 100 Percent and 60 Percent Achievement Levels

Target Group	Mean	Median	Mode
100%	61.7%	59.5%	none
60%	69.7%	69.5%	72.0%

A comparison of posttest results at both the onset and termination of treatment also confirmed that Outcome Objective 1 was achieved. An analysis of the achievement level for 60 percent of the students is recorded in Table 18.

Table 18

Analysis of Achievement Level of Target Group

Onset Chapter 30	Termination Chapter 38	60% Achievement Level	Goal Low - High
Mean: 48.0%	74.3%	74.5%	58% - 78%
Median: 50.0%	64.0%	72.0%	60% - 80%
Mode: 30.0%	64.0%	64.0%	40% - 60%

The comparative information presented in Table 18 clearly acknowledged that Outcome Objective 1 was achieved. The mean

achievement level indicated that 60 percent of the students not only increased their scores by 10 percent but also met the higher achievement level of increasing posttest scores by 30 percent.

Outcome Objective 2: After ten weeks, 60 percent of the tenth grade biology students, upon completion of the teacher prepared Reading Study Guide will score 75 percent or higher on a teacher prepared Reading Study Guide.

The Reading Study Guide treatment was devised as a method to encourage students to read textbook assignments. As a result of teacher observing student homework behaviors, it seemed plausible that students were more likely to complete written assignments than reading assignments. The Reading Study Guides connected the reading assignment to written work that was graded. As a result, more reading assignments were completed. A statistical tabulation of student achievement was compiled for each RSG, pretest and posttest relative to each chapter during the ten week treatment period (Appendix Z:108 through Appendix DD:116). A summary of student achievement levels on the RSG during the ten week treatment is listed in Table 19.

Table 19

RSG Achievement Level of Target Group

Chapter RSG	Mean	Median	Mode	Completion Rate
30	2.33	2.00	2.00	77.8%
31	3.05	3.00	3.00	77.8%
32	3.25	3.50	4.00	88.9%
33	2.50	3.00	3.00	59.3%
34	2.92	3.00	3.00	96.3%
35	2.65	3.00	3.00	74.1%
36	2.15	2.0	2.00	44.4%
38	.62	0.00	0.00	40.7%
Average:	2.43	3.0	3.0	69.9%

Additionally, a summary of student achievement on the RSG treatment was compiled for 60 percent of the target group. Results are listed in Table 20.

Table 20

RSG Achievement Level for 60 Percent
of Target Group

Chapter	Number of Students	Mean	Median	Mode
30	12.6	2.92	3.0	3.0
31	12.6	3.46	3.0	3.0
32	14.4	3.85	4.0	4.0
33	9.6	3.10	3.00	3.00
34	15.6	3.50	3.50	3.00
35	12.0	3.41	3.00	3.00
36	7.2	2.57	3.00	3.00
38	6.6	.85	1.00	0.00
Average:		2.93	3.00	3.00

A comparison of RSG treatment levels at both the onset and termination of treatment indicated that Outcome Objective 2 was not achieved. An analysis of the achievement level for 100 percent and 60 percent of the target group is summarized in Table 12.

Table 21

Analysis of RSG Treatment Scores for Target Group

	Onset Chapter 30	Termination Chapter 38	60% Achievement Level	Goal
Mean:	73.3%	56.2%	58.5%	75.0%
Median:	70.0%	50.0%	60.0%	75.0%
Mode:	70.0%	50.0%	50.0%	75.0%

Although onset and termination achievement results indicated otherwise, Outcome Objective 2 was achieved if one considers the average score for 60 percent of the target group. It was noted by the author that only 25 percent of the class completed the RSG for chapter 38 as it was near the end of the school year and student participation was minimal. Therefore, the average RSG achievement level for all chapters during the ten week treatment was considered relative to Outcome Objective 2. Although the last chapter considered for the RSG treatment did not meet expectations, the average score on all chapters was considered of equal importance with regard to final analysis. A summary of the average RSG treatment scores is listed in Table 22.

Table 22

A Comparison of RSG Achievement Scores for 100 Percent and 60 Percent of the Target Group

Target Group	Mean	Median	Mode	Goal
100%	74.3%	80.0%	80.0%	75.0%
60%	79.3%	80.0%	80.0%	75.0%

An additional analysis was made to compare achievement levels on the RSG treatment with both pretest and posttest scores (Appendix EE:118). The RSG grade did not seriously impact test scores as posttest results were statistically significant for less than 40 percent of the treatment. A summary is listed in Table 23.

Table 23

RSG Achievement Scores Correlated with Pretest and Posttest Results

RSG Grade	Pretest Average Score	Posttest Average Score	Net Change
A	64.2%	66.7%	+ 2.5
B	59.8%	53.1%	+ 3.3
C	49.8%	56.1%	+ 6.3
D	55.7%	55.6%	- 0.1
F	51.6%	55.9%	+ 4.3
Did not Complete	48.6%	53.2%	+ 4.6

Outcome Objective 3: By the tenth week, each tenth grade regular biology student, upon completion of the RSG treatment will achieve scores on the RSG, pretest and posttest which are commensurate with individual student reading stanines.

Initially, it was assumed by the author that reading stanine levels were comparable to expected achievement levels. However, during the RSG treatment, Cloze test results indicated that student reading stanines were not commensurate with student ability levels. Student reading stanines were assigned to one of three Cloze ability levels and, as a result, each reading stanine group was given a projected range of achievement. Cloze test results revealed that reading stanine levels were not indicative of ability as student achievement levels did not fall within projected ranges. Student scores fell outside projected achievement levels at a rate of 36.4 percent or four out of 11 events. A comparison of reading stanines and Cloze test results for chapters 34, 35, 36 and 38 is listed in Table 21 (Appendix AA:110 through Appendix DD:116).

Table 23

A Comparison of Cloze Test Results and
Student Reading Stanines

Cloze Ability Level	Read Stan	# Stud	Projected Ability	Cloze Results - Percent				
				34	35	36	38	Average
Independent	7-8	11	50% +	36.8	36.6	47.4	50.7	42.8%
Instruction	4-6	16	30%-49%	35.4	32.0	38.8	38.5	36.2%
Frustrated	3	3	0%-29%	17.0	--	40.6	51.3	36.3%

A comparison of the RSG, pretest and posttest scores at both the onset and termination of treatment indicated that outcome objective 3 was not achieved. Chapter 38 had a reading level of 7 and did not contain difficult science information. However, the chapter and related learning activities were administered during the final weeks of school and student participation was minimal as less than half the students in the target group completed the RSG for the last two chapters during treatment. Throughout the ten week treatment, the average participation rate was approximately 70 percent. A Comparison of the RSG treatment, pretest and posttest results for chapters 30 and 38 is listed in Table 24 (Appendix Z:108 and Appendix FF:120).

Table 24

A Comparison of RSG, Pretest and Posttest Results at Onset and Termination of Treatment

Reading Stanine	Onset - Chapter 30			Termination - Chapter 38		
	RSG	Pretest	Posttest	RSG	Pretest	Posttest
8	2.3	72.0%	51.7%	1.0	62.0%	68.7%
7	3.5	62.5%	55.0%	1.0	52.7%	71.3%
6	1.7	45.0%	28.8%	--	36.0%	45.0%
5	2.1	54.4%	49.4%	--	54.9%	63.4%
4	1.7	32.5%	41.7%	.7	59.5%	67.0%
3	2.0	31.7%	55.0%	.0	63.3%	64.0%

In comparing pretest and posttest scores on chapter 30, students improved posttest scores within a range of one to 18 percentage points whereas students improved posttest scores on

chapter 30 by much as 25 points. At termination of treatment, the average increase in the posttest score was 16 points. The most dramatic increase in scores was observed when comparing pretest scores of chapter 30 to pretest scores of chapter 38. Students at the third and fourth reading stanine improved by an average of 32 percentage points whereas students at higher reading stanine levels dropped. Admittedly, the students at lower stanine levels had the lowest pretest scores on chapter 30 but worked and improved so that their pretest scores on chapter 38 were among the highest. In this regard, students at the lower stanine levels demonstrated a greater improvement in test scores than the other students. The RSG treatment influenced their scores by forcing them to read textbook assignments. The net change in the RSG, pretest and posttest scores at the onset and termination of the treatment is listed in Table 25.

Table 25

Net Change of RSG, Pretest and Posttest Results at
Onset and Termination of Treatment

Read Stan	Net Change - 30 Pre/Post		Net Change - 38 Pre/Post		Net Change Pre30/Pre38	Net Change Post30/Post38
8	- 20.4	C	+ 6.7	D	- 10.0	+ 17.1
7	- 7.5	B+	+ 18.6	D	- 9.8	+ 16.3
6	- 16.3	C-	+ 9.0	-	- 9.0	+ 16.2
5	- 5.0	C	+ 8.5	-	+ .5	+ 14.0
4	+ 9.1	C-	+ 7.5	F	+ 27.0	+ 25.4
3	+ 23.3	C	+ 1.0	-	+ 37.6	+ 9.0
AVER:	- 2.8	C	+ 8.9	-	+ 6.1	+ 16.3

Although Outcome Objective 3 was not achieved as stated, student test scores improved and students learned to use the RSG as a resource. It assisted them in deciphering pertinent information from each chapter. In retrospect, it was not likely that students would perform at ability levels predetermined by reading stanines as student performance with regard to nine week grades was not commensurate with ability level either. For the average pretest result, students at reading stanine level 8 or the independent level were only ten points higher than reading stanine level 3, the frustrational level. The average grade on the RSG was equivalent. For the average posttest result, the level 8 stanine group was only six points higher than stanine level 3. The students categorized at lower reading stanines benefited by using the RSG as it improved their test results by a greater margin than the higher ability students (Appendix FF:120). The grade on the RSG did not fluctuate between reading stanine or ability levels as anticipated. At the end of the ten week treatment, the average score for all chapters relative to the RSG, pretest and posttest results was calculated and is listed in Table 26 (Appendix EE:118 and Appendix GG:122).

Table 26

Average Score for all Chapters on RSG, Pretest and Posttest Results during the Ten Week Treatment

Cloze Level	Read Stan	# Stud	RSG	Pretest	Posttest	Net Change
Independent	8	3	2.6/C+	61.7%	64.3%	+ 2.6
Independent	7	4	3.0/B	59.9%	66.2%	+ 6.3
Instruction	6	4	2.1/C	43.8%	45.3%	+ 1.5
Instruction	5	9	2.3/C	57.3%	59.1%	+ 1.8
Instruction	4	4	2.2/C	60.0%	57.6%	- 2.4
Frustrated	3	3	2.4/C+	51.1%	58.1%	+ 7.0

Summary

During the RSG treatment, student average posttest scores improved by 30 percent, meeting Outcome Objective 1. Although calculations proved the posttest results were statistically significant for only 37.4 percent of the treatment, both 60 percent and 100 percent of the target group improved their posttest scores by 30 percent. Students did not perform as expected on the RSG and, by the end of treatment, 60 percent of the target group did not score 75 percent or better on the Reading Study Guides. As stated, students did not meet Outcome Objective 2. Participation during the final weeks of treatment was minimal as the close of school for summer vacation was approaching. However, statistics calculated to determine the overall average for the RSG treatment indicated that the target group averaged 74.3 percent and 60 percent of the target group averaged 79.3 percent.

Although ending chapter statistics did not meet Outcome Objective 2, overall RSG grade average for the entire treatment period did meet the 75 percent level of achievement.

Outcome Objective 3 was not achieved in that all students who participated performed at approximately at the same achievement level. Although student reading stanine levels were identified as 3 through 8, there was little or no difference in achievement level within the target group. Analysis of Cloze test results indicated student ability levels did not coincide with achievement or reading stanine levels. However, by the end of treatment, nine of the 27 participating students moved up to a higher ability level. Overall, the RSG treatment was successful in that students were encouraged to read the textbook assignment and, due to time constraints, the RSG eliminated notetaking by students. Since the RSG was student generated, it also served to highlight important information, outlined chapter material and was used as notes to study for chapter tests.

CHAPTER V

Recommendations

The Reading Study Guide treatment, a method to encourage reading of the student textbook at home, was a successful endeavor as it eliminated copious copying of teacher prepared notes, highlighted the main points of each chapter, outlined chapter contents, provided additional class time for activities and served as a study sheet for chapter tests. Students who were classed at the instructional and frustrational ability levels benefited from the RSG as test scores and ability levels improved. Students whose reading stanines were average or below improved their achievement levels to within the achievement range of higher ability students. As a result, the RSG treatment has been expanded to include all tenth grade regular biology students at the high school. The product, process and benefits can be extended to other science and subject areas where reading textbook assignments is critical to learning. The RSG treatment was of more value than most ancillary material provided by the textbook publisher. Bloom's taxonomy of cognitive behaviors and higher order thinking skills were incorporated into the successful completion of each RSG whereas the publisher's ancillary material was primarily level 1 or knowledge. As a result, the publisher will be approached regarding both the readability and production of a new kind of ancillary

material to accompany the textbook. Additionally, a brief article will be submitted to the NSTA magazine, The Science Teacher, for publication and distribution of results to other science teachers who are dealing with similar problems.

Reference List

- Bean, Thomas W. "Analogical Study Guides: Improving Comprehension in Science." *Journal of Reading*. ERIC EJ 325 214.
- Bean, Thomas W., and Bonnie Ericson. "Text Previews and Three Level Study Guides for Content Area Critical Reading." *Journal of Reading*. ERIC EJ 381 819.
- Bechtel, Judith and Bettie Franzblau. "Reading in the Science Classroom." ERIC ED 204130.
- Betskouski, Marianne B. and Sandra Kirk McDonald. "A Study of Differential Problem Solving Behaviors in Processing a Science Text Passage." ERIC ED 255 384.
- Collette, Alfred T., and Eugene Chiappetta. Science Instruction in Middle and Secondary Schools, 1984. St. Louis: Times Mirror/Mosby College Publishers, 1984.
- Emmel, Thomas C., et al. Biology 1986. New York: Harcourt Brace Jovanovich, 1986.
- Fulton, Annie N., and Hampton S. Williams. "The Effectiveness of Selected Teaching Strategies Integrating the Teaching of Science Concepts with the Improvement of Reading-Language Skills." *Educational and Psychological Research*. ERIC EJ 362 025.
- Hampton City School Board, Va. "Reading Skills Development in Content Areas. Handbook I." ERIC ED 096 625.
- Kurland, Daniel. "The Nature of Scientific Discussion: Reading and the Introductory Science Course." *Journal of Reading*. ERIC EJ 291 321.
- Miami Sunset Senior High School. Ten Year Sacs Self-Study Report. May 1990.
- Morrison, Beverly. "The Identification of Reading Skills Essential for Learning in Seven Content Areas at Postelementary Levels." ERIC ED 185 536.
- Prince George's County Public Schools. "The Basic Skills Curriculum." ERIC ED 204 779.

Samson, Karen Margolis. "On Training Students to Extract Gist from Expository Text." ERIC ED 229 726.

Schallert, Diane and Robert Tierney. "Learning from Expository Text-Structure with Reader Characteristics." ERIC ED 221 833.

Shebilski, Wayne L. and John A. Rotondo. "Typographical and Spatial Cues that Facilitate Learning from Textbooks." Visible Language." ERIC EJ 249 791.

Thelen, Judith. "Improving Reading in Science. Reading Aids Series." ERIC ED 116 181.

Wright, Jill D. "The Effect of Reduced Readability Text Materials Comprehension and Biology Achievement." Science Education. ERIC EJ 258 479.

Wright, Jill and Dixie Spiegel. "How Important is Textbook Readability to Biology Teachers?" American Biology Teacher. ERIC EJ 300 327.

Appendix A
Student Survey - Science Reading Assignments

Appendix A

Student Survey - Science Reading Assignments

Ninety-seven students participated in this survey.

1. If your academic grade in Biology is less than you hoped for, what is the MAIN reason for your lack of achievement?

51% A) not studying for tests
8% B) not reading textbook and other assignments
20% C) not completing homework
11% D) not completing laboratories when assigned
11% E) other reason than those listed
2. What is the BEST teaching method for teachers to be certain that students read textbook assignments?

15% A) pop quiz
40% B) individual oral participation in class discussions
33% C) written assignments
8% D) none
2% E) other method than those listed
3. How often do you read the textbook assignments if you have to simultaneously complete a written assignment?

16% A) 20% of the time
9% B) 40% of the time
11% C) 60% of the time
47% D) 80% of the time
18% E) 100% of the time
4. In Biology, would you read the textbook assignments if you did NOT have to complete some type of written assignment?

72% A) NO
28% B) YES
5. Do you believe the copying of teacher prepared notes is a good method for teachers to assist you outlining the chapter?

28% A) NO
72% B) YES

6. On occasions when you are unable to read the textbook assignment, what is the MOST FREQUENT reason for NOT reading the assignment?

23%	A) boring
9%	B) part time employment outside school
39%	C) too much other homework
15%	D) sports and other extracurricular activities
12%	E) reasons other than those listed

7. What classroom changes might science teachers make to assist you in learning course material and improve your academic grade?

5%	A) increase class to more than 45 minutes in length
13%	B) textbook that is easier to understand
15%	C) more activities in class
55%	D) outside class activities and field trips
12%	E) method other than those listed

Appendix B

Teacher Survey - Science Reading Assignments

Appendix B

Teacher Survey - Science Reading Assignments

Fifteen science teachers participated in this survey.

1. Based upon current student achievements in your classroom, what do you observe as the PRIMARY CONTRIBUTING FACTOR for the lack of student success?

22%	A)	not completing written assignments
25%	B)	not reading textbook/assignments
18%	C)	not studying for tests
16%	D)	poor attendance
16%	E)	inadequate lab results
0%	F)	other

2. Upon giving an OUTSIDE CLASS reading assignment, approximately what percent of your students read the assignment for class discussion?

60%	A)	20%
30%	B)	40%
10%	C)	60%
0%	D)	80%
0%	E)	almost 100%

3. Upon giving an IN CLASS reading assignment, approximately what percent of your students read the assignment for class discussion?

24%	A)	20%
28%	B)	40%
36%	C)	60%
14%	D)	80%
0%	E)	almost 100%

4. By what procedure, do you verify that students read assigned pages in the textbook?

12%	A)	pop quiz
28%	B)	individual oral participation
28%	C)	written assignment
32%	D)	class discussion
0%	E)	none
0%	F)	other

5. Pertaining to students who DO NOT read class assignments on a regular basis, what is the most frequent excuse for not reading assignments?

10%	A) boring topic
26%	B) part time employment outside school
30%	C) too much other homework
15%	D) sports and other extracurricular activities
8%	E) no home supervision
2%	F) other

6. Pertaining to students who DO READ class assignments on a regular basis, what is the most frequent excuse for not reading assignments?

0%	A) boring topic
36%	B) part time employment outside school
27%	C) too much other homework
21%	D) sports and other extracurricular activities
0%	E) no home supervision
7%	F) other

Appendix C

Pre and Post Test Results - Chapters 30 and 31

Period 2

Appendix C

Pre and Post Test Results - Chapters 30 and 31

Period 2

ID #	PRE-30	POST-30	RSG	PRE-31	POST-31	RSG
7474406.0	8.0	9.0	1.0	13.0	17.0	4.0
7679361.0			2.0	14.0		4.0
7209423.0	10.0	7.0	2.0			0.0
2193895.0	11.0	15.0	3.0	23.0	25.0	4.0
9257107.0	10.0	10.0	1.0	10.0	18.0	2.0
7777561.0	10.0	10.0	3.0	15.0	17.0	2.0
8689492.0			0.0		2.0	0.0
7582481.0			0.0			0.0
7448500.0	6.0	6.0	0.0	14.0	13.0	1.0
7626594.0	13.0	18.0	4.0	21.0	26.0	3.0
9926637.0	11.0	13.0	2.0	15.0	17.0	0.0
9479412.0	7.0	12.0	0.0	8.0	13.0	0.0
516726.0	8.0	11.0	1.0	15.0	15.0	2.0
7637624.0	12.0	14.0	4.0	16.0	24.0	4.0
516726.0			1.0	8.0	22.0	2.0
7520936.0	11.0	14.0	3.0	19.0	22.0	0.0
9561962.0	6.0	6.0	0.0		11.0	0.0
84536.0	11.0	4.0	2.0	8.0	12.0	4.0
9880643.0			2.0	13.0	14.0	0.0
497869.0	11.0	15.0	4.0	20.0	22.0	4.0
7637129.0	10.0	11.0	1.0	12.0	21.0	3.0
2178178.0	11.0	15.0	3.0	9.0	18.0	3.0
7855656.0		13.0	4.0		9.0	0.0
7423693.0	11.0	12.0	1.0		14.0	0.0
1041475.0	11.0	11.0	3.0	15.0	17.0	3.0
9076862.0		9.0	0.0		20.0	0.0
512173.0				25.0	25.0	4.0

TOTALS:	188.0	235.0	47.0	340.0	414.0	49.0
AVERAGE:	9.9	11.2	1.8	14.7	17.2	1.8
AVERAGE IN %:	49.5	48.7		73.2	75.0	
CHANGE %:		.8			1.8	

Appendix D

Pre and Post Test Results - Chapters 30 and 31

Period 3

Appendix D

Pre and Post Test Results - Chapters 30 and 31

Period 3

ID#	PRE-30	POST-30	RSG	PRE-31	POST-31	RSG
8017635.0	13.0	10.0	3.0	18.0	22.0	4.0
7482300.0	5.0	7.0	1.0	13.0	15.0	4.0
1581356.0	8.0	9.0	1.0	14.0	17.0	3.0
8458912.0	8.0	12.0	2.0	17.0	19.0	3.0
8943210.0	5.0	9.0		6.0	17.0	3.0
7414949.0	9.0	10.0	1.0	11.0	17.0	
7403546.0	14.0	10.0	3.0		19.0	3.0
810847.0	13.0	11.0	3.0	19.0	24.0	4.0
9965578.0		6.0	2.0	7.0		2.0
7033161.0	11.0	8.0	2.0	12.0	13.0	4.0
1051200.0	12.0	11.0	3.0	18.0	19.0	
8603822.0	10.0	11.0	4.0		17.0	4.0
8303240.0	13.0	13.0	3.0	13.0	21.0	
906159.0		9.0		16.0	16.0	3.0
7430325.0	9.0	6.0	1.0	12.0	13.0	
8929640.0	8.0	8.0				2.0
8006696.0	15.0	14.0	3.0	12.0	18.0	3.0
2186775.0		6.0		7.0	10.0	
69840.0	9.0	5.0	2.0	14.0		2.0
9513054.0	8.0	6.0		13.0	20.0	
268046.0			3.0	11.0		2.0
1252006.0	7.0					
1380964.0		5.0		7.0	17.0	3.0
7690870.0	12.0	15.0	2.0	22.0	21.0	3.0
9159155.0	12.0	10.0	1.0	5.0	12.0	2.0
1059006.0		6.0		6.0		
8103616.0	11.0	12.0	3.0	16.0	20.0	4.0
7419692.0						
7969978.0	16.0	13.0	3.0	16.0	21.0	3.0
7022825.0	6.0	12.0		17.0	22.0	3.0
TOTALS:	234.0	254.0	46.0	368.0	410.0	64.0
AVERAGE:	10.2	9.4	2.3	12.9	17.8	3.0
AVERAGE						
IN %:	50.9	40.9		64.4	77.5	
CHANGE %:		9.9			13.1	

Appendix E

Pre and Post Test Results - Chapters 30 and 31

Period 6

Appendix E

Pre and Post Test Results - Chapters 30 and 31

PERIOD 6

ID #	PRE-30	POST-30	RSG	PRE-31	POST-31	RSG
9932725.0	8.0	6.0		6.0	14.0	1.0
8383127.0	10.0	10.0	4.0	11.0		
1415894.0	15.0	12.0	4.0	20.0	22.0	4.0
7617840.0	7.0	5.0			17.0	1.0
8472847.0	9.0	15.0	3.0	15.0	17.0	
7404841.0	10.0	3.0		14.0	20.0	2.0
1051200.0	6.0	14.0	4.0	12.0	19.0	1.0
7541619.0	14.0	15.0	4.0	21.0	24.0	4.0
7547758.0		7.0		10.0	10.0	3.0
7895157.0		12.0	4.0	18.0	21.0	4.0
529571.0	9.0	8.0	3.0	13.0	22.0	2.0
7664396.0					24.0	4.0
7451850.0	6.0	8.0	2.0	16.0	16.0	3.0
1595886.0						
9755474.0	9.0	10.0	3.0	10.0	13.0	3.0
7449219.0	6.0	7.0		9.0		
9137549.0	9.0	5.0	1.0	7.0	22.0	
1052183.0	11.0	11.0	4.0	16.0	24.0	1.0
7655551.0				15.0		
9935737.0	14.0	13.0	4.0	18.0	24.0	4.0
9404203.0	15.0	14.0	4.0	17.0	25.0	4.0
256702.0	9.0	9.0	4.0	10.0	17.0	4.0
7441299.0	10.0	10.0	3.0	14.0		3.0
7661954.0	13.0	12.0	4.0	18.0		3.0
8649537.0	11.0	9.0	2.0	14.0	21.0	3.0
8139893.0	9.0	16.0	2.0	14.0	24.0	2.0
7128243.0	14.0	14.0	1.0	15.0	21.0	4.0
551425.0	8.0	8.0				
TOTALS:						
AVERAGE:	232.0	253.0	60.0	393.0	417.0	60.0
	10.1	10.1	3.2	13.9	19.9	2.9
AVERAGE						
IN %:	50.4	44.0		69.4	86.4	
CHANGE %:						
		6.4			17.0	

Appendix F

Pre and Post Test Results - Chapters 30 and 31

Period 8

Appendix F

Pre and Post Test Results - Chapters 30 and 31

PERIOD B

ID #	PRE-30	POST-30	RSG	PRE-31	POST-31	RSG
7532733.0	16.0	12.0	3.0	21.0		4.0
1550054.0	9.0	9.0	0.0	9.0		4.0
1436303.0	8.0	10.0		10.0		2.0
1459165.0				20.0		2.0
2019512.0	12.0	14.0	2.0	14.0		2.0
9114604.0	13.0	13.0	2.0	20.0		4.0
9094781.0	13.0	14.0	3.0	13.0		
394768.0	6.0	3.0		9.0		2.0
1989443.0	7.0	12.0		12.0		4.0
514689.0	9.0	11.0	3.0	19.0		4.0
7417050.0	9.0	7.0	1.0	12.0		4.0
1388603.0	8.0	5.0	1.0	11.0		4.0
8703523.0	5.0	8.0		15.0		4.0
7401061.0	8.0	11.0	2.0	14.0		4.0
7694880.0	8.0	4.0	1.0	18.0		4.0
285818.0	18.0	17.0	4.0	5.0		
440256.0		12.0	2.0	12.0		3.0
7496781.0	6.0	6.0	2.0	15.0		4.0
9441635.0		16.0	4.0	7.0		3.0
7001324.0	9.0	7.0		15.0		3.0
7396296.0			2.0	12.0		
7420714.0				6.0		
7496799.0		8.0	3.0	16.0		3.0
9263667.0	10.0	10.0	2.0			3.0
9456569.0	11.0	12.0	1.0	14.0		
7604805.0	11.0	13.0	2.0	8.0		4.0
7444631.0	10.0	12.0	2.0	11.0		4.0
7527362.0	16.0	18.0	4.0	22.0		4.0
906042.0				21.0		0.0
118936.0	14.0	16.0	2.0	12.0		4.0
8724313.0		13.0	4.0			
1619545.0	15.0	13.0	4.0	15.0		
TOTALS:	251.0	306.0	56.0	464.0	0.0	85.0
AVERAGE:	10.5	10.9	2.3	13.6	ERROR	3.3
AVERAGE IN %:	52.3	47.5		68.0	ERROR	
CHANGE %:		4.8			ERROR	

Appendix G
Sample Cloze Test - Chapter 34

Appendix G

Sample Cloze Test - Chapter 34

Almost three-quarters of all animal species on Earth are insects. Sit in the countryside _____ even in a city _____ on a warm summer _____ and you can observe _____ variety and abundance of _____ and the important roles _____ play in the world _____ them. A honeybee flies _____ blossom to blossom, pollinating _____ while extracting nectar that _____ be converted to honey _____ the hive. A grasshopper, _____ destructive in its feeding _____, chews on a cabbage _____. A ladybug crawls along _____ tomato leaf, ridding the _____ of destructive aphids. Bees, _____, ladybugs and aphids are _____ a few of the _____ insects. In fact, there _____ are more than 750,000 different _____ of insects. In their diversity, insects are the most successful of all groups of animals.

Appendix H

RSG Treatment Statistics - Chapter 34

Appendix H

RSG Treatment Statistics - Chapter 34

ID NUMBER	READ	34-CH.CLOZE/NON	34-CH.CLOZE/TECH	34-RSG CLOZE/NON	34-RSG CLOZE/TECH	34-PRE	34-RSG	34-POST
7969978	8	48%	64%	35%	24%	96%	A	88%
8303240	8	36%	49%	24%	7%	76%	A	68%
1380964	8	18%	56%	35%	18%	64%	A	64%
8603822	7	48%	0	36%	35%	0	B	76%
7403546	7	18%	56	7%	6%	68%	A	68%
8103616	7	42%	56%	28%	36%	92%	A	92%
8006696	7	30%	16%	0	18%	76%	B	84%
0069840	6	30%	8%	42%	24%	72%	C	46%
7430325	6	0	0	0	0	58%	A	38%
9965578	6	0	0	0	0	72%	B	72%
1059006	6	0	0	0	0	25	O	30%
0810847	5	30%	56%	14%	42%	88%	A	84%
7690870	5	24%	40%	35%	40%	92%	B	84%
9159155	5	30%	32%	0	0	0	C	34%
8017635	5	42%	80%	28%	48%	88%	A	76%
1051200	5	36%	56%	35%	30%	64%	B	76%
7033161	5	0	0	0	0	34%	C	30%
8929640	5	0	0	0	0	46%	B	60%
9513054	5	42%	64%	35%	36%	80%	O	72%
7414949	5	0	0	0	0	0	F	0
0268046	4	24%	40%	28%	24%	46%	B	50%
0906159	4	36%	32%	21%	18%	42%	B	76%
7482300	4	36%	48%	14%	18%	58%	B	46%
1581356	4	42%	56%	28%	42%	60%	F	60%
8458912	3	0	0	0	0	50%	B	54%
7022825	3	0	0	0	0	64%	B	0
8943210	3	0	0	0	0	72%	B	72%

Appendix I
Sample RSG - Chapter 34

Appendix I

Sample RSG - Chapter 34

BIOLOGY
RSG-CH.34

INSECTS



Name _____

OVERVIEW:

Date _____ per _____

1. Three PHYSICAL TRAITS which have contributed to the evolutionary success of insects are:

a) _____ b) _____ c) _____

The small size of most insects allows them to CO-EXIST because d) _____

How are wings an ADAPTATION for survival? e) _____

2. Describe how insects affect mankind.

a) harmful _____ b) helpful _____

3. Three body sections of insects are the a) _____ b) _____ c) _____

They have d) _____ pair of legs and modified mouth parts for different feeding methods. How does each obtain food?

e) grasshopper _____ f) butterfly _____ g) fly _____

4. A scientist who studies insects is called a(n): _____

GRASSHOPPER -- REPRESENTATIVE INSECT

5. Study the EXTERNAL VIEW of the grasshopper.

Place the NUMBER of the structure responsible for each function:

hold/chew/tear food: _____

smell: _____

sight: _____

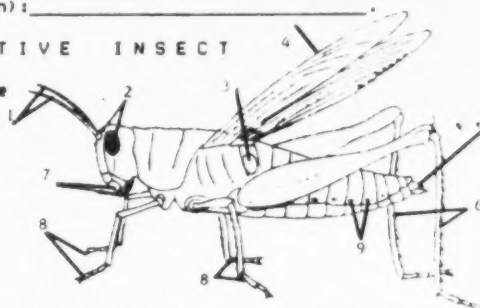
flight: _____

sound: _____

jumping: _____

walking: _____

air entry: _____



6. Study the INTERNAL VIEW of the grasshopper. Place the NUMBER of the structure responsible for each function:

pumps "blood": _____

stores food: _____

grinds food: _____

moistens food: _____

filters blood: _____

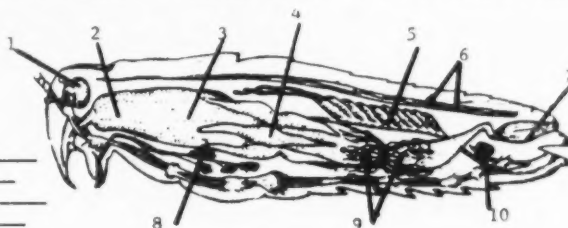
nerve control/coordination: _____

sperm receptacle/storage: _____

removes wastes from "blood": _____

secretes digestive juices: _____

production of eggs: _____



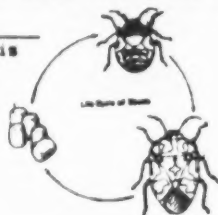
COLOR these ORGANS: gastric caecae--GREEN, alimentary canal--BROWN, reproductive tract--PINK

The a) _____ functions like the human kidney to remove liquid wastes. However, it excretes URIC ACID CRYSTALS (solid) instead of urine as a way to b) _____.

INSECT DEVELOPMENT:

7. Define METAMORPHOSIS. a) _____

Identify each of these life cycles as COMPLETE or INCOMPLETE metamorphosis.

b) _____
metamorphosisc) _____
metamorphosis



The CORRECT SEQUENCE of stages for INCOMPLETE METAMORPHOSIS is d) _____ e) _____
 f) _____ LABEL EACH OF THESE STAGES IN 7-A. The f) _____ stage is a miniature adult.
 (The CORRECT SEQUENCE of stages for COMPLETE METAMORPHOSIS is g) _____ h) _____
 i) _____ j) _____ LABEL EACH OF THESE STAGES IN 7-B. The k) _____ stage is
 wormlike and feeds upon decomposing l) _____. The m) _____ or n) _____ stage
 appears inactive but internal molecules are rearranged to form a totally different organism.
 During which stage is the organism sexually mature? o) _____ What is the advantage of
 INCOMPLETE METAMORPHOSIS (worm eating stage) over COMPLETE METAMORPHOSIS (nymph eating stage)?
 p) _____

INSECT BEHAVIOR:

8. Define SOCIAL INSECTS. a) _____

The PURPOSE of a social order in insect is for some b) _____

9. Identify the SOCIAL STRUCTURE of the following social insects:

a) ANT: 1) _____ sex: _____ Job: _____
 2) _____ sex: _____ Job: _____
 3) _____ sex: _____ Job: _____

b) HONEYBEE: 1) _____ sex: _____ Job: _____
 2) _____ sex: _____ Job: _____
 3) _____ sex: _____ Job: _____



c) TERMITE: 1) _____ sex: _____ Job: _____
 2) _____ sex: _____ Job: _____
 3) _____ sex: _____ Job: _____
 4) _____ sex: _____ Job: _____



10. What determines the kind of LABORER into which larva develop? _____

COMMUNICATION:

11. Insects COMMUNICATE about these topics: a) _____ b) _____ c) _____
 Insects COMMUNICATE by the following methods:

a) _____ b) _____ c) _____
 ex: _____ ex: _____ ex: _____



DEFENSE:

12. Define MIMICRY. a) _____

Mimicry provides

protection by imitating insects with similar b) _____ or fooling
 predators by their similarity to insects which c) _____

13. Define CAMOUFLAGE. a) _____ Two examples of insect

CAMOUFLAGE in South Florida are b) _____ and c) _____

Appendix J
Pretest - Chapter 34

Appendix J

Pretest - Chapter 34

QUIZ -- CH. 34: INSECTS

Directions: Read each statement carefully. Choose the best answer. Shade in the appropriate space on your scantron answer sheet.

- 1) A scientist who studies insects is called a(n):
a) biologist b) zoologist c) insectologist
d) entomologist
- 2) The name ARTHROPODA means:
a) soft body b) spiny skinned c) jointed leg d) false feet
- 3) What is the purpose or social contribution of the drone in the honeybee society?
a) protects the hive b) gathers food c) cares for the larva
d) mate with the queen
- 4) Of what importance are the Arthropods on the planet Earth?
a) as scavengers b) eat harmful insect pests c) serves as a food source for animals d) all of these
- 5) Animals having a chitinous exoskeleton, jointed legs and segmented bodies are:
a) echinoderms b) reptiles c) chordates d) arthropods
- 6) The simple eye of an arthropods functions by detecting:
a) colors b) pressure changes c) movement d) light
- 7) What is the advantage of COMPLETE METAMORPHOSIS (worm eating stage) over INCOMPLETE METAMORPHOSIS?
a) reproduces faster b) no mate is needed c) different food sources d) there is no advantage
- 8) Identify the correct sequence of events for COMPLETE METAMORPHOSIS:
a) nymph, pupa, adult
b) egg, pupa, larva, adult
c) pupa, larva, adult, egg
d) egg, larva, pupa, adult
- 9) The periodic shedding of the exoskeleton is called:
a) growth b) molting c) metamorphosis d) regeneration
- 10) The special excretory structure of the class insects is similar to the human kidney. It is called the:
a) green gland b) ovipositor c) malpighian tubule
d) renal gland
- 11) Arthropods must conserve water loss. To do so, nitrogenous wastes are excreted in the solid form as:
a) urine b) urea c) ammonia d) uric acid
- 12) How does a social insect communicate the location of food?
a) flashing light b) pheromones c) body motions d) leads others to food
- 13) Among social insects, the sex of the worker is:
a) male b) female c) they are hermaphroditic d) there are no workers

QUIZ -- Ch. 34: INSECTS

- 14) In which of these stages will the organism appear dormant?
a) nymph b) larva c) pupa d) none of these
- 15) How does a social insect communicate the location of food?
a) flashing light b) pheromones c) body motions d) leads others to food
- 16) The compound eyes of insects function by detecting:
a) detail b) shadows c) light and motion d) distant predators
- 17) Of what importance are the Arthropods on the planet Earth?
a) as scavengers b) eat harmful insect pests c) serves as a food source for animals d) all of these
- 18) Which of these is not a stage of complete metamorphosis?
a) egg b) pupa c) nymph d) larva
- 19) The transformation of an insect from its immature form to the adult form is called:
a) development b) maturation c) growth d) metamorphosis
- 20) Pheromones are:
a) chemicals which influence the behavior of other insects
b) poisons used to paralyze and devour food
c) undigested waste products stored in the crop
d) hormones that control metamorphosis
- 21) Animals having a chitinous exoskeleton, jointed legs and segmented bodies are:
a) echinoderms b) reptiles c) chordates d) arthropods
- 22) Metamorphosis among insects is controlled by:
a) weather b) seasons c) amount of daylight d) hormones
- 23) How does mimicry improve an arthropods change for survival?
a) resembles something dangerous to predator b) blends in with surroundings and not seen by predator c) appears as something of no food value to predator d) all of these
- 24) The tympanums are insect organs which detect:
a) odors b) sound or motion c) light d) pheromones
- 25) Grasshoppers are able store food in a structure called a:
a) gizzard b) malpighian tubule c) crop d) tympanum

Appendix K

RSG - Chapter 34, Answers for Overhead Projector

Appendix K

RS6 - Chapter 34, Answers for Overhead Projector

ANSWERS -- CH. 34 INSECTS

1. A) EXOSKELETON B) SEGMENTED BODIES C) JOINTED APPENDAGES
 D) NOT COMPETE FOR SAME FOOD RESOURCES E) GET AWAY FROM PREDATORS
2. A) EAT CROPS/CAUSE DISEASE B) EAT OTHER INSECTS/SERVE AS FOOD FOR OTHER ANIMALS
3. A) HEAD B) THORAX C) ABDOMEN D) 3 E) CHEWS F) SUCKS G) LAPPING

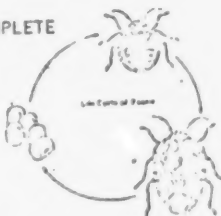
4. ENTOMOLOGIST

5. HOLD/CHEW FOOD: 7
 SHELL: 1
 SIGHT: 2
 FLIGHT: 4
 SOUND: 3
 JUMPING: 6
 WALKING: 8
 AIR ENTRY: 9
6. PUMPS BLOOD: 6
 STORES FOOD: 2
 GRINDS FOOD: 3
 MOISTENS FOOD: 8
 FILTERS BLOOD: 9
 NERVE CONTROL: 1
 SPERM RECEPTACLE: 10
 REMOVES WASTE: 9
 SECRETES DIGESTIVE JUICES: 4
 PRODUCTION OF EGGS: 5
- A) MALPIGHIAN TUBULE
 B) CONSERVE WATER

7. A) SERIES OF MOLTS
 THAT TRANSFORM IMMATURE
 FORM TO ADULT

B) INCOMPLETE

- D) EGG E) NYMPH F) ADULT
 G) EGG H) LARVA I) PUPA J) ADULT
 K) LARVA L) MATTER M) PUPA
 N) COCOON O) ADULT
 P) DIFFERENT FOOD SOURCES



C) COMPLETE



8. A) LIVE TOGETHER IN COMMUNITIES B) DIVISION OF LABOR

9. A) 1--QUEEN----F----PRODUCE YOUNG
 2--MALE----M----MATE
 3--WORKER---F----PROVIDE FOOD, CARE FOR YOUNG

- B) 1--QUEEN----F----PRODUCE YOUNG
 2--DRONE----M----MATE
 3--WORKER---F----PROVIDE FOOD, CARE FOR YOUNG

- C) 1--QUEEN----F----PRODUCE YOUNG
 2--KING-----M----MATE
 3--SOLDIER---M----DEFEND COLONY
 4--WORKER---F----PROVIDE FOOD, CARE FOR YOUNG

10. TYPE OF FOOD EATEN

11. A) FOOD SOURCE B) PREDATORS C) POSSIBLE MATE

- A) CHEMICALS B) VISUAL SIGNALS C) MOTIONS
 EX. PHEROMONES EX. FLASHING LIGHTS EX. TAPPING, RUBBING, OR STROKING

12. A) SIMILARITY OF APPEARANCE B) DEFENSE MECHANISMS C) TASTE BAD OR STING

13. A) BLEND IN WITH SURROUNDINGS B) ---- C) ----

Appendix L
Posttest - Chapter 34

Posttest - Chapter 34

QUIZ -- CH. 34: INSECTS

Directions: Read each statement carefully. Choose the best answer. Shade in the appropriate space on your scantron answer sheet.

- 1) Arthropods must conserve water loss. To do so, nitrogenous wastes are excreted in the solid form as:
a) urine b) urea c) ammonia d) uric acid
- 2) The simple eye of an arthropod functions by detecting:
a) colors b) pressure changes c) movement d) light
- 3) Among social insects, the sex of the worker is:
a) male b) female c) they are hermaphroditic d) there are no workers
- 4) What is the purpose or social contribution of the drone in the honeybee society?
a) protects the hive b) gathers food c) cares for the larva
d) mate with the queen
- 5) Spiders, scorpions and ticks belong to the class:
a) Insecta b) Diplopoda c) Chilopoda d) Arachnida
- 6) The periodic shedding of the exoskeleton is called:
a) growth b) molting c) metamorphosis d) regeneration
- 7) The special excretory structure of the class insects is similar to the human kidney. It is called the:
a) green gland b) ovipositor c) malpighian tubule
d) renal gland
- 8) The name ARTHROPODA means:
a) soft body b) spiny skinned c) jointed leg d) false feet
- 9) A pupa or cocoon stage of insects is:
a) inactive stage during which the organism is totally transformed
b) final stage of development after molting occurs
c) wormlike organism which devours great quantities of food
d) one stage in the life cycle of all insects
- 10) An example of a social insect is the:
a) beetle b) grasshopper c) spider d) honeybee
- 11) A scientist who studies insects is called a(n):
a) biologist b) zoologist c) insectologist
d) entomologist
- 12) Identify the correct sequence of events for COMPLETE METAMORPHOSIS:
a) nymph, pupa, adult
b) egg, pupa, larva, adult
c) pupa, larva, adult, egg
d) egg, larva, pupa, adult
- 13) What is the advantage of COMPLETE METAMORPHOSIS (worm eating stage) over INCOMPLETE METAMORPHOSIS?
a) reproduces faster b) no mate is needed c) different food sources
d) there is no advantage

QUIZ -- Ch. 34: INSECTS

- 14) How does mimicry improve an arthropods change for survival?
 - a) resembles something dangerous to predator
 - b) blends in with surroundings and not seen by predator
 - c) appears as something of no food value to predator
 - d) all of these
- 15) Metamorphosis among insects is controlled by:
 - a) weather
 - b) seasons
 - c) amount of daylight
 - d) hormones
- 16) The transformation of an insect from its immature form to the adult form is called:
 - a) development
 - b) maturation
 - c) growth
 - d) metamorphosis
- 17) Pheromones are:
 - a) chemicals which influence the behavior of other insects
 - b) poisons used to paralyze and devour food
 - c) undigested waste products stored in the crop
 - d) hormones that control metamorphosis
- 18) Spiders, scorpions and ticks belong to the class:
 - a) Insecta
 - b) Diplopoda
 - c) Chilopoda
 - d) Arachnids
- 19) A pupa or cocoon stage of insects is:
 - a) inactive stage during which the organism is totally transformed
 - b) final stage of development after molting occurs
 - c) wormlike organism which devours great quantities of food
 - d) one stage in the life cycle of all insects
- 20) In which of these stages will the organism appear dormant?
 - a) nymph
 - b) larva
 - c) pupa
 - d) none of these
- 21) The tympanums are insect organs which detect:
 - a) odors
 - b) sound or motion
 - c) light
 - d) pheromones
- 22) An examples of a social insect is the:
 - a) beetle
 - b) grasshopper
 - c) spider
 - d) honeybee
- 23) Which of these is not a stage of complete metamorphosis?
 - a) egg
 - b) pupa
 - c) nymph
 - d) larva
- 24) Grasshoppers are able store food in a structure called a:
 - a) gizzard
 - b) malpighian tubule
 - c) crop
 - d) tympanum
- 25) The compound eyes of insects function by detecting:
 - a) detail
 - b) shadows
 - c) light and motion
 - d) distant predators

Appendix M

Summary of Cloze Test Results - Chapters 34, 35, 36, 38

Appendix M

Summary of Cloze Test Results - Chapters 34, 35, 36, 38

Chapter 34 - Insects: Correct Response in Percent

Reading Stanine	NonTechnical Textbook	Passage RSG	Technical Textbook	Passage RSG	Overall
8	34.0	31.3	56.3	16.3	40.1
7	36.0	32.0	56.0	25.6	33.5
6	30.0	42.0	8.0	24.0	26.0
5	34.0	29.6	54.7	39.2	39.8
4	34.5	22.3	44.0	25.5	31.7
3	-	-	16.0	18.0	17.0

Chapter 35 - Fishes: Correct Response in Percent

Reading Stanine	NonTechnical Textbook	Passage RSG	Technical Textbook	Passage RSG	Overall
8	44.0	35.0	53.0	24.7	39.2
7	46.0	35.6	41.1	13.0	34.0
6	48.0	24.0	7.0	49.0	32.0
5	33.0	31.2	23.3	28.0	28.9
4	28.0	54.0	46.6	28.0	37.8
3	--	--	--	--	--

Chapter 36 - Amphibians: Correct Response in Percent

Reading Stanine	NonTechnical Textbook	Passage RSG	Technical Textbook	Passage RSG	Overall
8	54.6	44.7	50.0	--	49.8
7	50.0	48.6	31.7	--	44.9
6	46.0	45.5	26.3	--	38.0
5	52.0	48.0	34.1	--	44.7
4	48.0	49.7	27.8	--	41.1
3	52.0	44.0	27.0	--	40.6

Chapter 38 - Birds: Correct Response in Percent

Reading Stanine	NonTechnical Textbook	Passage RSG	Technical Textbook	Passage RSG	Overall
8	61.7	72.0	30.3	62.6	56.6
7	49.5	52.0	40.5	36.0	44.7
6	42.0	23.0	40.0	32.0	34.3
5	31.8	64.2	21.8	41.4	38.9
4	42.5	50.6	25.0	41.3	39.0
3	71.0	52.0	40.0	42.0	51.3

Appendix N

Comparison of Textbook and RSG Cloze Test Results

Chapters 34, 35, 36 and 38

Appendix N

Comparison of Textbook and RSG Cloze Test Results

Chapter 34 - Insects: Correct Response in Percent

Reading Stanine	Textbook	RSG	Overall
8	45.2	23.8	40.1
7	44.0	24.6	33.5
6	19.0	33.0	26.0
5	44.3	34.3	39.8
4	39.3	24.1	31.7
3	--	--	--

Chapter 35 - Fishes: Correct Response in Percent

Reading Stanine	Textbook	RSG	Overall
8	48.5	29.8	39.2
7	43.7	24.3	34.0
6	27.5	36.5	32.0
5	28.2	26.8	27.8
4	37.3	38.4	37.8
3	--	--	--

Chapter 36 - Amphibians: Correct Response in Percent

Reading Stanine	Textbook	RSG	Overall
8	52.8	44.7	49.8
7	42.6	48.6	44.9
6	36.1	45.5	38.0
5	43.0	48.0	44.7
4	37.9	49.7	41.1
3	29.6	44.0	40.6

Chapter 38 - Birds: Correct Response in Percent

Reading Stanine	Textbook	RSG	Overall
8	34.5	50.5	56.6
7	45.0	44.0	44.7
6	41.0	27.5	34.3
5	27.3	52.8	38.9
4	33.8	46.0	39.0
3	55.5	47.0	51.3

Appendix O

Comparison of NonTechnical and Technical Reading Passages

Chapters 34, 35, 36 and 38

Appendix D

Comparison of NonTechnical and Technical Reading Passages

Chapter 34 - Insects: Percent of Class in each Category

Level	NonTech (Text/RSG)	Technical (Text/RSG)	Textbook Average	RSG Average	Overall Average
Independent	5.6	35.3	37.9	2.9	20.4
Instructional	44.1	23.5	28.1	39.5	33.8
Frustrated	50.3	40.9	40.0	57.3	45.6

Chapter 35 - Fishes: Percent of Class in each Category

Level	NonTech (Text/RSG)	Technical (Text/RSG)	Textbook Average	RSG Average	Overall Average
Independent	28.0	21.4	29.1	20.0	24.7
Instructional	31.0	23.9	38.2	16.7	27.5
Frustrated	41.0	54.7	32.4	63.3	47.9

Chapter 36 - Amphibians: Percent of Class in Each Category

Level	NonTech (Text/RSG)	Technical (Text/RSG)	Textbook Average	RSG Average	Overall Average
Independent	55.06	--	39.6	--	--
Instructional	31.3	--	33.3	--	--
Frustrated	8.9	--	28.9	--	--

Chapter 38 - Birds: Percent of Class in Each Category

Level	NonTech (Text/RSG)	Technical (Text/RSG)	Textbook Average	RSG Average	Overall Average
Independent	65.0	25.6	30.6	60.0	45.3
Instructional	13.7	24.5	22.2	13.3	17.8
Frustrated	23.9	50.0	47.2	26.7	36.9

Appendix P
Comparison of NonTechnical and Technical Cloze Passages
Chapters 34, 35, 36 and 38

Appendix P

Comparison of NonTechnical and Technical Cloze Passages

Chapters 34, 35, 36 and 38

Chapter	Technical Textbook RSG		Tech Average	NonTechnical Textbook RSG		NonTech Average	Overall Average
34	38.0	28.0	33.0	31.0	41.0	36.0	34.5
35	31.0	30.0	30.5	36.0	37.0	36.5	33.5
36	33.0	46.0	39.5	48.0	41.0	44.5	42.0
38	34.0	49.0	41.5	48.0	34.0	41.0	41.3

Appendix Q

Summary of Cloze Test Results - Chapters 34, 35, 36 and 38

Appendix Q

Summary of Cloze Test Results - Chapters 34, 35, 36 and 38

Chapter 34 - Insects: Percent of Class in Each Category

Level	Textbook		RSG	
	NonTech	Tech	NonTech	Tech
Independent	11.0	64.0	0.0	6.0
Instructional	44.0	12.0	44.0	35.0
Frustrated	45.0	24.0	56.0	59.0

Chapter 35 - Fishes: Percent of Class in Each Category

Level	Textbook		RSG	
	NonTech	Tech	NonTech	Tech
Independent	29.0	29.0	27.0	13.0
Instructional	35.0	41.0	27.0	7.0
Frustrated	36.0	30.0	46.0	80.0

Chapter 36 - Amphibians: Percent of Class in Each Category

Level	Textbook		RSG	
	NonTech	Tech	NonTech	Tech
Independent	63.0	17.0	47.0	--
Instructional	29.0	38.0	33.0	--
Frustrated	8.0	45.0	9.0	--

Chapter 38 - Birds: Percent of Class in Each Category

Level	Textbook		RSG	
	NonTech	Tech	NonTech	Tech
Independent	50.0	11.0	80.0	40.0
Instructional	22.0	22.0	0.0	27.0
Frustrated	28.0	67.0	20.0	33.0

Appendix R

Standard Deviation and Other Computations - Chapter 30

Appendix R

Standard Deviation and Other Computations - Chapter 30

ID NUMBER	READ	STAN	PRE-30	SQUARE	POST-30	SQUARE	RSG-30
8017635.00	5.00	13.00	169.00	10.00	100.00	3.00	
7482300.00	4.00	5.00	25.00	7.00	49.00	2.00	
1581356.00	4.00	8.00	64.00	9.00	81.00	1.00	
8458912.00	3.00	8.00	64.00	12.00	144.00	2.00	
8943210.00	3.00	5.00	25.00	9.00	81.00		
7414949.00	5.00	9.00	81.00	10.00	100.00	1.00	
7403546.00	7.00	14.00	196.00	10.00	100.00	3.00	
810847.00	5.00	13.00	169.00	11.00	121.00	3.00	
9965578.00	6.00			6.00	36.00	2.00	
7033161.00	5.00	11.00	121.00	8.00	64.00	2.00	
1051200.00	5.00	12.00	144.00	11.00	121.00	3.00	
8603822.00	7.00	10.00	100.00	11.00	121.00	4.00	
8303240.00	8.00	13.00	169.00	13.00	169.00	3.00	
906159.00	4.00			9.00	81.00		
7430325.00	6.00	9.00	81.00	6.00	36.00	1.00	
7022825.00	3.00	6.00	36.00	12.00	144.00		
8929640.00	5.00	8.00	64.00	8.00	64.00		
8006696.00	7.00	15.00	225.00	14.00	196.00	4.00	
169840.00	6.00	9.00	81.00	5.00	25.00	2.00	
9513054.00	5.00	8.00	64.00	6.00	36.00		
268046.00	4.00					3.00	
1380964.00	8.00			5.00	25.00	1.00	
7690870.00	5.00	12.00	144.00	15.00	225.00	2.00	
9159155.00	5.00	12.00	144.00	10.00	100.00	1.00	
1059006.00	6.00			6.00	36.00		
8103616.00	7.00	11.00	121.00	12.00	144.00	3.00	
7969978.00	8.00	16.00	256.00	13.00	169.00	3.00	
SUM OF COL	146.00	227.00	2543.00	248.00	2568.00	49.00	
COUNT	27.00	22.00	22.00	26.00	26.00	21.00	
MEAN AVERA	5.41	10.32	115.59	9.54	98.77	2.33	
MEAN SQUAR			106.46		90.98		
MEAN AVER-D			9.13		7.79		
SQUARE ROO			3.02		2.79		
MEAN AVERA	5.41	10.32		9.54		2.33	
MEAN DIFFENCE							
MEAN-100%		51.49		47.60		.78	
MEDIAN	5.00	9.00		10.00		2.00	
MODE	5.00	8.00		8.00		3.00	
SD (s)			3.02		2.79		
PRE-30 RESTS						.26	
POST-30 RELTS						.28	
MEAN-100%		51.49		47.60			
MEDIAN-100		45.00		48.00			
MODE-100%		40.00		30.00			
READING LEL 8.0				50.00			

Appendix S

Standard Deviation and Other Computations - Chapter 31

Appendix S

Standard Deviation and Other Computations - Chapter 31

ID NUMBER	READ	STAN	PRE-31	SQUARE	POST-31	SQUARE	RSG-30	
8017635.00		5.00	18.00	324.00	22.00	484.00	4.00	
7482300.00		4.00	13.00	169.00	15.00	225.00	4.00	
1581356.00		4.00	14.00	196.00	17.00	289.00	3.00	
8458912.00		3.00	17.00	289.00	19.00	361.00	3.00	
8943210.00		3.00	6.00	36.00	17.00	289.00	3.00	
7414949.00		5.00	11.00	121.00	17.00	289.00		
7403546.00		7.00			19.00	361.00	3.00	
810847.00		5.00	19.00	361.00	23.00	529.00	4.00	
9965578.00		6.00	7.00	49.00			2.00	
7033161.00		5.00	12.00	144.00	13.00	169.00	4.00	
1051200.00		5.00	18.00	324.00	19.00	361.00		
8603822.00		7.00			17.00	289.00	4.00	
8303240.00		8.00	13.00	169.00	21.00	441.00		
906159.00		4.00	16.00	256.00	16.00	256.00	3.00	
7430325.00		6.00	12.00	144.00	13.00	169.00		
7022825.00		3.00	17.00	289.00	22.00	484.00	3.00	
8929640.00		5.00					2.00	
8006696.00		7.00	12.00	144.00	18.00	324.00	3.00	
169840.00		6.00	14.00	196.00			2.00	
9513054.00		5.00	13.00	169.00	20.00	400.00		
268046.00		4.00	11.00	121.00			2.00	
1380964.00		8.00	7.00	49.00	17.00	289.00	3.00	
7690870.00		5.00	22.00	484.00	21.00	441.00	3.00	
9159155.00		5.00	5.00	25.00	12.00	144.00	2.00	
1059006.00		6.00	6.00	36.00				
8103616.00		7.00	16.00	256.00	20.00	400.00	4.00	
7969978.00		8.00	16.00	256.00	21.00	441.00	3.00	
SUM OF COL	146.00		315.00	4607.00	399.00	7435.00	64.00	
COUNT	27.00		24.00	24.00	22.00	22.00	21.00	
MEAN AVERA	5.41		13.12	191.96	18.14	337.95	3.05	
MEAN SQUARD				172.27		328.93		
MEAN AVER-D				19.69		9.03		
SQUARE ROD				4.44		3.00		
MEAN AVERA	5.41		13.12		18.14	337.95	3.05	
MEAN DIFFERENCE							3.00	5.01
PERCENT-10			56.44		77.99	0.00	3.00	
MEDIAN	5.00		13.00		17.00			
MODE	5.00		13.00		17.00			
SD (s)				4.44		3.00		
PRE-31 RESTS								1.13
POST-31 RELTS								5.01
MEAN-100%			56.44		77.99			
MEDIAN-100			57.00		74.00			
MODE-100%			57.00		74.00			

READING LEL 9.0

Appendix T

Standard Deviation and Other Computations - Chapter 32

Appendix T

Standard Deviation and Other Computations - Chapter 32

ID NUMBER	READ	STAN	PRE-32	SQUARE	POST-32	SQUARE	RSG-32
8017635.00		5.00	16.00	256.00	17.00	289.00	2.00
7482300.00		4.00	15.00	225.00	13.00	169.00	4.00
1581356.00		4.00	14.00	196.00	15.00	225.00	2.00
8458912.00		3.00					4.00
8943210.00		3.00	15.00	225.00	16.00	256.00	3.00
7414949.00		5.00	8.00	64.00	10.00	100.00	3.00
7403546.00		7.00	8.00	64.00	10.00	100.00	4.00
810847.00		5.00	17.00	289.00	18.00	324.00	4.00
9965578.00		6.00	15.00	225.00	16.00	256.00	4.00
7033161.00		5.00	9.00	81.00	10.00	100.00	4.00
1051200.00		5.00	11.00	121.00	13.00	169.00	4.00
8603822.00		7.00					4.00
8303240.00		8.00	14.00	196.00	15.00	225.00	3.00
906159.00		4.00	16.00	256.00	17.00	289.00	4.00
7430325.00		6.00	12.00	144.00	14.00	196.00	1.00
7022825.00		3.00	16.00	256.00	17.00	289.00	3.00
8929640.00		5.00	14.00	196.00	15.00	225.00	2.00
8006696.00		7.00	18.00	324.00	19.00	361.00	4.00
169840.00		6.00	5.00	25.00	6.00	36.00	2.00
9513054.00		5.00	16.00	256.00	17.00	289.00	
268046.00		4.00	11.00	121.00	13.00	169.00	
1380964.00		8.00	9.00	81.00	10.00	100.00	3.00
7690870.00		5.00	15.00	225.00	16.00	256.00	4.00
9159155.00		5.00	5.00	25.00	10.00	100.00	2.00
1059006.00		6.00	5.00	25.00	7.00	49.00	
8103616.00		7.00	10.00	100.00	12.00	144.00	4.00
7969978.00		8.00	13.00	169.00	14.00	196.00	4.00
SUM OF COL	146.00		307.00	4145.00	340.00	4912.00	78.00
COUNT	27.00		25.00	25.00	25.00	25.00	24.00
MEAN AVERA	5.41		12.28	165.80	13.60	196.48	3.25
MEAN SQUARD				150.80		184.96	
MEAN AVER-D				15.00		11.52	
SQUARE ROD				3.87		3.39	
MEAN AVERA	5.41		12.28		13.60		3.25
MEAN DIFFENCE							1.32
PERCENT-10			49.12		54.40	0.00	
MEDIAN	5.00		13.00		14.00		3.50
MODE	5.00		14.00		17.00		4.00
SD (s)				3.87		3.39	
PRE-32 RESTS							.34
POST-32 RELTS							.39
MEAN-100%			49.12		54.40		
MEDIAN-100			52.00		54.00		
MODE-100%			56.00		68.00		
READING LEL 8.0			64.00				

Appendix U

Standard Deviation and Other Computations - Chapter 33

Standard Deviation and Other Computations - Chapter 33

ID NUMBER	READ STAN	PRE-33	SQUARE	POST-33	SQUARE	RSG-33
8017635.00	5.00	8.00	64.00	7.00	49.00	0.00
7482300.00	4.00	9.00	81.00	9.00	81.00	2.00
1581356.00	4.00	7.00	49.00	7.00	49.00	
8458912.00	3.00	6.00	36.00	6.00	36.00	3.00
8943210.00	3.00	7.00	49.00	7.00	49.00	
7414949.00	5.00					
7403546.00	7.00	8.00	64.00	8.00	64.00	3.00
810847.00	5.00	9.00	81.00	9.00	81.00	3.00
9965578.00	6.00	7.00	49.00	7.00	49.00	
7033161.00	5.00	4.00	16.00	4.00	16.00	3.00
1051200.00	5.00	6.00	36.00	6.00	36.00	
8603822.00	7.00	8.00	64.00	8.00	64.00	
8303240.00	8.00	8.00	64.00	8.00	64.00	
906159.00	4.00	9.00	81.00	9.00	81.00	3.00
7430325.00	6.00	4.00	16.00	11.00	121.00	2.00
7022825.00	3.00	6.00	36.00	6.00	36.00	3.00
8929640.00	5.00	6.00	36.00	6.00	36.00	
8006696.00	7.00	7.00	49.00	6.00	36.00	3.00
169840.00	6.00	7.00	49.00	7.00	49.00	2.00
9513054.00	5.00	10.00	100.00	10.00	100.00	
268046.00	4.00	4.00	16.00	4.00	16.00	
1380964.00	8.00	6.00	36.00	6.00	36.00	0.00
7690870.00	5.00	7.00	49.00	7.00	49.00	3.00
9159155.00	5.00					3.00
1059006.00	6.00	4.00	16.00	4.00	16.00	
8103616.00	7.00	7.00	49.00	7.00	49.00	4.00
7969978.00	8.00	10.00	100.00	10.00	100.00	3.00
SUM OF COLU	146.00	174.00	1286.00	179.00	1363.00	40.00
COUNT	27.00	25.00	25.00	25.00	25.00	16.00
MEAN AVERAG	5.41	6.96	51.44	7.16	54.52	2.50
MEAN SQUARE	0.00	0.00	48.44		51.27	
MEAN AVER-SD			3.00		3.25	
SQUARE ROOT			1.73		1.80	
MEAN AVERAG	5.41	6.96		7.16	0.00	2.50
MEAN DIFFER						
PERCENT-100		57.77		59.43	0.00	.20
MEDIAN	5.00	7.00		7.00		3.00
MODE	5.00	7.00		7.00		3.00
SD (s)			1.73		1.80	
PRE-33 RESUS						
POST-33 RESTS						.12
						.11
MEAN-100%		57.77		59.43		
MEDIAN-100%		60.00		59.00		
MODE-100%		60.00		59.00		
READING LEV 9.0						

Appendix V

Standard Deviation and Other Computations - Chapter 34

Appendix V

Standard Deviation and Other Computations - Chapter 34

ID NUMBER	READ STAN	PRE-34	SQUARE	POST-34	SQUARE	RSG-34
8017635.00	5.00	21.00	441.00	18.00	324.00	4.00
7482300.00	4.00	13.00	169.00	11.00	121.00	3.00
1581356.00	4.00	14.00	196.00	14.00	196.00	0.00
8458912.00	3.00	12.00	144.00	13.00	169.00	3.00
8943210.00	3.00	17.00	289.00	17.00	289.00	3.00
7414949.00	5.00					0.00
7403546.00	7.00	16.00	256.00	16.00	256.00	4.00
810847.00	5.00	21.00	441.00	20.00	400.00	4.00
9965578.00	6.00	7.00	49.00	17.00	289.00	3.00
7033161.00	5.00	8.00	64.00	6.00	36.00	2.00
1051200.00	5.00	15.00	225.00	18.00	324.00	3.00
8603822.00	7.00			18.00	324.00	3.00
8303240.00	8.00	18.00	324.00	16.00	256.00	4.00
906159.00	4.00	10.00	100.00	18.00	324.00	3.00
7430325.00	6.00	13.00	169.00	9.00	81.00	4.00
7022825.00	3.00	15.00	225.00			3.00
8929640.00	5.00	10.00	100.00	14.00	196.00	3.00
8006696.00	7.00	18.00	324.00	20.00	400.00	3.00
169840.00	6.00	17.00	289.00	11.00	121.00	2.00
9513054.00	5.00	19.00	361.00	17.00	289.00	0.00
268046.00	4.00	10.00	100.00	12.00	144.00	3.00
1380964.00	8.00	15.00	225.00	15.00	225.00	4.00
7690870.00	5.00	22.00	484.00	20.00	400.00	3.00
9159155.00	5.00			8.00	64.00	2.00
1059006.00	6.00	5.00	25.00	6.00	36.00	
8103616.00	7.00	22.00	484.00	22.00	484.00	4.00
7969978.00	8.00	23.00	529.00	21.00	441.00	4.00
SUM OF COLU	146.00	361.00	6013.00	377.00	6189.00	76.00
COUNT	27.00	24.00	24.00	25.00	25.00	26.00
MEAN AVERAG	5.41	15.04	250.54	15.08	247.56	2.92
MEAN SQUARE	0.00		226.25		227.41	
MEAN AVER-SD			24.29		20.15	
SQUARE ROOT			4.93		4.49	
MEAN AVERAG	5.41	15.04		15.08		-2.96
MEAN DIFFERCE						
PERCENT-100		75.21		75.40		.04
MEDIAN	5.00	16.50		17.00		3.00
MODE	5.00	16.00		16.00		3.00
SD (s)			4.93		4.49	
PRE-34 RESUS						.01
POST-34 RESTS						.01
MEAN-100%		75.21		75.40		
MEDIAN-100%		70.00		68.00		
MODE-100%		64.00		76.00		
READING LEV 7.0		72.00				

Appendix W

Standard Deviation and Other Computations - Chapter 35

Standard Deviation and Other Computations - Chapter 35

ID NUMBER	READ STAN	PRE-35	SQUARE	POST-35	SQUARE	RSG-35
8017635.00	5.00	8.00	64.00	15.00	225.00	
7482300.00	4.00	20.00	400.00	20.00	400.00	3.00
1581356.00	4.00	18.00	324.00	20.00	400.00	3.00
8458912.00	3.00			19.00	361.00	1.00
8943210.00	3.00	15.00	225.00	16.00	256.00	4.00
7414949.00	5.00	10.00	100.00	15.00	225.00	0.00
7403546.00	7.00	17.00	289.00	18.00	324.00	3.00
810847.00	5.00	6.00	36.00	14.00	196.00	4.00
9965578.00	6.00	15.00	225.00	16.00	256.00	2.00
7033161.00	5.00	10.00	100.00	16.00	256.00	4.00
1051200.00	5.00	11.00	121.00	18.00	324.00	2.00
8603822.00	7.00	17.00	289.00	8.00	64.00	3.00
8303240.00	8.00	14.00	196.00	18.00	324.00	
906159.00	4.00	17.00	289.00	18.00	324.00	
7430325.00	6.00			9.00	81.00	1.00
7022825.00	3.00			16.00	256.00	2.00
8929640.00	5.00	13.00	169.00	13.00	169.00	3.00
8006696.00	7.00	9.00	81.00	8.00	64.00	4.00
169840.00	6.00	16.00	256.00	20.00	400.00	1.00
9513054.00	5.00	12.00	144.00	14.00	196.00	
268046.00	4.00	10.00	100.00	9.00	81.00	3.00
1380964.00	8.00	14.00	196.00	11.00	121.00	
7690870.00	5.00	13.00	169.00	8.00	64.00	3.00
9159155.00	5.00			8.00	64.00	
1059006.00	6.00	12.00	144.00	6.00	36.00	
8103616.00	7.00	13.00	169.00			3.00
7969978.00	8.00					4.00
SUM OF COLU	146.00	290.00	4086.00	353.00	5467.00	53.00
COUNT	27.00	22.00	22.00	25.00	25.00	20.00
MEAN AVERAG	5.41	13.18	185.73	14.12	218.68	2.65
MEAN SQUARE	0.00		173.76		199.37	
MEAN AVER-S	0.00		11.97		19.31	
SQUARE ROOT			3.46		4.39	
MEAN AVERAG	5.41	13.18		14.12		2.65
MEAN DIFFERCE						
PERCENT-100		52.73		56.48		.94
MEDIAN	5.00	13.50		15.00		3.00
MODE	5.00	12.00		18.00		3.00
SD (s)			3.46		4.39	
PRE-35 RESUS						.27
POST-35 RESTS						.21
MEAN-100%		52.73		56.48		
MEDIAN-100%		52.00		60.00		
MODE-100%		50.00		72.00		

READING LEV 6.0

Appendix X

Standard Deviation and Other Computations - Chapter 36

Appendix X

Standard Deviation and Other Computations - Chapter 36

ID NUMBER	READ	STAN	PRE-36	SQUARE	POST-36	SQUARE	RSG-36
8017635.00		5.00	11.00	121.00	12.00	144.00	
7482300.00		4.00	6.00	36.00	9.00	81.00	2.00
1581356.00		4.00	9.00	81.00	11.00	121.00	
8458912.00		3.00			7.00	49.00	
8943210.00		3.00	6.00	36.00	7.00	49.00	
7414949.00		5.00	8.00	64.00	7.00	49.00	
7403546.00		7.00	8.00	64.00	9.00	81.00	2.00
810847.00		5.00	11.00	121.00	9.00	81.00	2.00
9965578.00		6.00	14.00	196.00	12.00	144.00	
7033161.00		5.00	6.00	36.00	10.00	100.00	3.00
1051200.00		5.00			8.00	64.00	2.00
8603822.00		7.00	11.00	121.00	11.00	121.00	
8303240.00		8.00	9.00	81.00	12.00	144.00	
906159.00		4.00	6.00	36.00	9.00	81.00	
7430325.00		6.00	9.00	81.00	7.00	49.00	3.00
7022825.00		3.00	7.00	49.00	6.00	36.00	
8929640.00		5.00					
8006696.00		7.00	6.00	36.00	7.00	49.00	1.00
169840.00		6.00	6.00	36.00	8.00	64.00	0.00
9513054.00		5.00	12.00	144.00	7.00	49.00	
268046.00		4.00	5.00	25.00	5.00	25.00	2.00
1380964.00		8.00	4.00	16.00	6.00	36.00	
7690870.00		5.00	7.00	49.00	3.00	9.00	3.00
9159155.00		5.00	5.00	25.00	4.00	16.00	
1059006.00		6.00			6.00	36.00	
8103616.00		7.00	6.00	36.00			3.00
7969978.00		8.00					3.00
SUM OF COLU		146.00	172.00	1490.00	192.00	1678.00	28.00
COUNT		27.00	22.00	22.00	24.00	24.00	13.00
MEAN AVERAG		5.41	7.82	67.73	8.00	69.92	2.15
MEAN SQUARE				61.12		64.00	
MEAN AVER-SD				6.60		5.92	
SQUARE ROOT				2.57		2.43	
MEAN AVERAG		5.41	7.82		8.00		2.15
MEAN DIFFERCE							.18
PERCENT-100			46.91		48.00		
MEDIAN		5.00	7.50		8.00		2.00
MODE		5.00	6.00		7.00		2.00
SD (s)				2.57		2.43	
FRE-36 RESUS							.07
POST-36 RESTS							.07
MEAN-100%			46.91		48.00		
MEDIAN-100%			43.00		46.00		
MODE-100%			34.00		40.00		

READING LEV 8.0

Appendix Y

Standard Deviation and Other Computations - Chapter 38

Appendix Y

Standard Deviation and Other Computations - Chapter 38

ID NUMBER	READ STAN	PRE-38	SQUARE	POST-38	SQUARE	RSG-38
8017635.00	5.00	17.00	289.00	19.00	361.00	
7482300.00	4.00	12.00	144.00	21.00	441.00	2.00
1581356.00	4.00	14.00	196.00	15.00	225.00	0.00
8458912.00	3.00					0.00
8943210.00	3.00	13.00	169.00	21.00	441.00	
7414949.00	5.00	11.00	121.00	18.00	324.00	1.00
7403546.00	7.00	10.00	100.00	15.00	225.00	0.00
810847.00	5.00	18.00	324.00	17.00	289.00	
9965578.00	6.00					
7033161.00	5.00	14.00	196.00	21.00	441.00	0.00
1051200.00	5.00	9.00	81.00	14.00	196.00	0.00
8603822.00	7.00	12.00	144.00	7.00	49.00	1.00
8303240.00	8.00	15.00	225.00	19.00	361.00	
906159.00	4.00	12.00	144.00	11.00	121.00	
7430325.00	6.00					
7022825.00	3.00	15.00	225.00	17.00	289.00	
8929640.00	5.00	14.00	196.00			
8006696.00	7.00	5.00	25.00	5.00	25.00	2.00
169840.00	6.00	9.00	81.00	10.00	100.00	
9513054.00	5.00	13.00	169.00	13.00	169.00	
268046.00	4.00	8.00	64.00	12.00	144.00	0.00
1380964.00	8.00	13.00	169.00	16.00	256.00	1.00
7690870.00	5.00	17.00	289.00	15.00	225.00	0.00
9159155.00	5.00					
1059006.00	6.00	13.00	169.00	11.00	121.00	
8103616.00	7.00	13.00	169.00	15.00	225.00	
7969978.00	8.00					1.00
SUM OF COLU	146.00	277.00	3689.00	312.00	5028.00	8.00
COUNT	27.00	22.00	22.00	21.00	21.00	13.00
MEAN AVERAG	5.41	12.59	167.68	14.86	239.43	.62
MEAN SQUARE	0.00		158.53		220.73	
MEAN AVER-SD			9.15		18.69	
SQUARE ROOT			3.03		4.32	
MEAN AVERAG	5.41	12.59		14.86		.62
MEAN DIFFERCE						2.27
PERCENT-100		62.95		74.29		
MEDIAN	5.00	13.00		15.00		0.00
MODE	5.00	13.00		15.00		0.00
SD (s)			3.03		4.32	
PRE-38 RESUS						.75
POST-38 RESTS						.52
MEAN-100%		62.95		74.29		
MEDIAN-100%		58.00		64.00		
MODE-100%		58.00		64.00		

READING LEV 7.0

Appendix Z

RSG Statistics - Chapters 30 - 33

Appendix Z

RSG Statistics - Chapters 30 - 33

ID NUMBER	READ	30-PRE	30-RSG	30-POST	31-PRE	31-RSG	31-POST	32-PRE	32-RSG	32-POST	33-PRE	33-RSG	33-POST
8303240	8	64%	B	65%	57%	0	92%	56%	0	60%	68%	0	67%
1380964	8	0	D	25%	31%	B	74%	36%	B	42%	52%	F	50%
7969978	8	80%	B	65%	70%	B	92%	52%	A	58%	84%	B	83%
7403546	7	70%	B	50%	0	B	83%	32%	A	38%	68%	B	67%
8603822	7	50%	A	55%	0	A	74%	0	A	0	68%	0	67%
8006696	7	75%	A	70%	53%	B	77%	72%	A	76%	60%	B	59%
8103616	7	55%	B	60%	70%	A	87%	40%	A	46%	60%	A	59%
9965578	6	0	C	30%	31%	C	0	60%	A	64%	60%	0	59%
7430325	6	45%	D	30%	53%	0	57%	48%	D	54%	38%	C	92%
0069840	6	45%	C	25%	61%	C	0	20%	C	26%	60%	C	59%
1059006	6	0	0	30%	27%	0	0	24%	0	30%	38%	0	34%
8017635	5	65%	B	50%	77%	A	96%	64%	C	68%	60%	F	59%
7414949	5	45%	D	50%	49%	0	74%	32%	B	40%	0	0	0
0810847	5	65%	B	55%	83%	A	100%	68%	A	72%	76%	B	75%
7033161	5	55%	C	40%	53%	A	57%	36%	A	42%	38%	B	34%
1051200	5	60%	B	55%	77%	0	83%	44%	0	50%	52%	0	50%
8929640	5	40%	0	40%	0	C	0	56%	C	60%	52%	0	50%
9513054	5	40%	0	30%	57%	0	87%	64%	0	68%	84%	0	83%
7690870	5	60%	C	75%	96%	B	92%	60%	A	64%	60%	B	59%
9159155	5	60%	D	50%	23%	C	53%	22%	C	38%	0	B	0
7482300	4	25%	D	35%	57%	A	66%	56%	A	50%	76%	C	75%
1581356	4	40%	D	45%	61%	B	74%	56%	C	60%	60%	0	59%
0906159	4	0	0	45%	70%	B	70%	64%	A	68%	76%	B	75%
0268046	4	0	B	0	49%	C	0	44%	0	50%	38%	0	34%
8458912	3	40%	C	60%	74%	B	83%	0	A	0	52%	B	50%
8943210	3	25%	0	45%	27%	B	74%	60%	B	64%	60%	0	59%
7022825	3	30%	0	60%	74%	B	96%	64%	B	68%	52%	B	50%

Appendix AA
RSG Statistics - Chapter 34

Appendix AA

RSG Statistics - Chapter 34

ID NUMBER	READ	34-CH.CLOZE/NON	34-CH.CLOZE/TECH	34-RSG CLOZE/NON	34-RSG CLOZE/TECH	34-PRE	34-RSG	34-POST
7969978	8	48%	64%	35%	24%	96%	A	88%
8303240	8	36%	49%	24%	7%	76%	A	68%
1380964	8	18%	56%	35%	18%	64%	A	64%
8603822	7	48%	0	36%	35%	0	B	76%
7403546	7	18%	56	7%	6%	68%	A	68%
8103616	7	42%	56%	28%	36%	92%	A	92%
8006696	7	30%	16%	0	18%	76%	B	84%
0069840	6	30%	8%	42%	24%	72%	C	46%
7430325	6	0	0	0	0	58%	A	38%
9965578	6	0	0	0	0	72%	B	72%
1059006	6	0	0	0	0	25	0	30%
0810847	5	30%	56%	14%	42%	88%	A	84%
7690870	5	24%	40%	35%	40%	92%	B	84%
9159155	5	30%	32%	0	0	0	C	34%
8017635	5	42%	80%	28%	48%	88%	A	76%
1051200	5	36%	56%	35%	30%	64%	B	76%
7033161	5	0	0	0	0	34%	C	30%
8929640	5	0	0	0	0	46%	B	60%
9513054	5	42%	64%	35%	36%	80%	0	72%
7414949	5	0	0	0	0	0	F	0
0268046	4	24%	40%	28%	24%	46%	B	50%
0906159	4	36%	32%	21%	18%	42%	B	76%
7482300	4	36%	48%	14%	18%	58%	B	46%
1581356	4	42%	56%	28%	42%	60%	F	60%
8458912	3	0	0	0	0	50%	B	54%
7022825	3	0	0	0	0	64%	B	0
8943210	3	0	0	0	0	72%	B	72%

Appendix BB
RSG Statistics - Chapter 35

Appendix BB

RSG Statistics - Chapter 35

ID NUMBER	READ	35-CH.CLOZE/NON	35-CH.CLOZE/TECH	35-RSG CLOZE/NON	35-RSG CLOZE/TECH	35-PRE	35-RSG	35-FOST
7969978	8	36%	70%	60%	28%	80%	A	80%
8303240	8	60%	54%	21%	18%	58%	O	72%
1380964	8	36%	35%	24%	28%	0	O	34%
8603822	7	48%	40%	35%	18%	60%	B	64%
7403546	7	48%	42%	48%	7%	68%	B	72%
8103616	7	42%	42%	24%	14%	34%	B	60%
8006696	7	30%	42%	24%	21%	60%	A	64%
0069840	6	48%	7%	24%	49%	42%	D	34%
7430325	6	0	0	0	0	58%	D	46%
9965578	6	0	0	0	0	42%	C	58%
1059006	6	0	0	0	0	0	O	34%
0810847	5	24%	7%	0	0	72%	A	80%
7690870	5	36%	42%	36%	14%	0	B	76%
9159155	5	30%	28%	36%	0%	50%	O	34%
8017635	5	12%	07%	24%	49%	42%	O	60%
1051200	5	42%	7%	36%	21%	68%	C	72%
7033161	5	0	0	0	0	50%	A	22%
8929640	5	0	0	0	0	0	B	64%
9513054	5	54%	49%	24%	28%	68%	O	34%
7414949	5	0	0	0	0	0	F	0
0268046	4	36%	49%	60%	35%	64%	B	80%
0906159	4	24%	49%	48%	28%	26%	O	58%
7482300	4	24%	42%	0%	21%	50%	B	54%
1581356	4	0	0	0	0	50%	B	50%
8458912	3	0	0	0	0	0	D	30%
7022825	3	0	0	0	0	34%	D	30%
8943210	3	0	0	0	0	54%	C	0
						46%	A	72%

Appendix CC
RSG Statistics - Chapter 36

Appendix CC

RSG Statistics - Chapter 36

ID NUMBER	READ	36-CH.CLOZE/NON	36-CH.CLOZE/TECH	36-RSG CLOZE/TECH	36-PRE	36-RSG	36-POST
7969978	8	56%	50%	55%	64%	B	70%
8303240	8	60%	50%	47%	64%	O	52%
1380964	8	48%	0	32%	22%	O	34%
8603822	7	0	43%	50%	34%	C	57%
7403546	7	36%	33%	41%	46%	C	40%
8103616	7	64%	37%	55%	64%	B	64%
8006696	7	48%	30%	29%	82%	D	70%
0069840	6	32%	37%	41%	34%	F	46%
7430325	6	56%	27%	0	34%	O	40%
9965578	6	64%	53%	50%	34%	O	52%
1059006	6	32%	08%	0	40%	O	11%
0810847	5	64%	37%	41%	34%	C	50%
7690870	5	44%	37%	55%	0	B	40%
9159155	5	0	0	0	28%	O	28%
8017635	5	60%	40%	53%	52%	O	70%
1051200	5	36%	27%	38%	46%	C	52%
7033161	5	44%	24%	41%	0	B	34%
8929640	5	0	24%	0	0	O	46%
9513054	5	68%	50%	61%	70%	O	40%
7414949	5	48%	0	47%	0	O	0
0268046	4	52%	33%	41%	52%	C	64%
0906159	4	40%	05%	0	52%	O	40%
7482300	4	60%	40%	58%	40%	C	34%
1581356	4	40%	33%	50%	0	O	0
8458912	3	52%	24%	38%	28%	O	22%
7022825	3	60%	20%	0	34%	O	0
8943210	3	44%	37%	50%	34%	O	40%

Appendix DD

RSG Statistics - Chapter 38

Appendix DD

RSB Statistics - Chapter 38

ID NUMBER	READ	38-CH.CLOZE/NON	38-CH.CLOZE/TECH	38-RSG.CLOZE/NON	38-RSG.CLOZE/TECH	38-PRE	38-RSG	38-POST
7969978	8	64%	55%	88%	78%	72%	D	80%
8303240	8	64%	18%	76%	68%	76%	D	72%
1380964	8	57%	18%	52%	42%	38%	D	54%
8603822	7	0	0	0	0	50%	D	76%
7403546	7	28%	50%	0	0	54%	F	50%
8103616	7	71%	31%	52%	36%	0	0	0
8006696	7	14%	04%	23%	15%	54%	C	88%
0069840	6	42%	40%	23%	32%	42%	D	60%
7430325	6	0	0	0	0	30%	D	30%
9965578	6	0	0	0	0	0	0	0
1059006	6	0	0	0	0	0	0	0
0810847	5	57%	22%	75%	52%	60%	D	88%
7690870	5	21%	25%	23%	15%	64%	F	80%
9159155	5	0	0	0	0	58%	D	68%
8017635	5	50%	29%	83%	52%	60%	0	64%
1051200	5	14%	07%	82%	52%	46%	F	64%
7033161	5	42%	11%	0	0	42%	F	46%
8929640	5	0	0	0	0	54%	D	34%
9513054	5	07%	37%	58%	36%	0	0	0
7414949	5	0	0	0	0	0	0	0
0268046	4	28%	22%	0	0	58%	F	88%
0906159	4	35%	22%	47%	31%	64%	D	72%
7482300	4	57%	19%	58%	57%	58%	C	58%
1581356	4	50%	37%	47%	36%	58%	F	50%
8458912	3	71%	40%	52%	42%	72%	F	64%
7022825	3	0	0	0	0	58%	D	64%
8943210	3	0	0	0	0	60%	0	0

Appendix EE

RSG Achievement Level - Pretest and Posttest Results

Appendix EE

RSG Achievement Level - Pretest and Posttest Results

RSG Grade	Pretest Scores in Percent								Pretest Average Score *
	30	31	32	33	34	35	36	38	
A (4.0)	62.5	68.0	54.0	60.0	78.8	61.6	--	--	64.2
B (3.0)	65.6	61.8	48.0	62.9	62.0	54.3	64.0	--	59.8
C (2.0)	50.0	41.0	43.6	58.0	53.0	54.7	42.0	56.0	49.8
D (1.0)	43.0	--	48.0	--	--	44.7	82.0	61.0	55.7
F (0.0)	--	--	--	56.0	60.0	--	34.0	56.3	51.6
Did not Complete	33.8	53.3	46.4	58.0	52.5	48.8	41.0	54.6	48.6

RSG Grade	Posttest Scores in Percent								Posttest Average Score *
	30	31	32	33	34	35	36	38	
A (4.0)	67.5	80.0	57.8	59.0	72.3	63.6	--	--	66.7
B (3.0)	60.0	81.5	53.5	61.3	68.2	65.0	52.0	--	63.1
C (2.0)	46.0	53.0	50.4	75.3	36.7	65.0	49.5	73.0	56.1
D (1.0)	39.2	--	54.0	--	--	36.7	70.0	78.0	55.6
F (0.0)	--	--	--	54.5	60.0	--	46.0	63.1	55.9
Did not Complete	41.7	78.6	51.6	56.2	56.0	46.6	39.6	60.6	53.2

*

Appendix FF

RSG Achievement Level and Reading Stanines

Appendix FF

RSG Achievement Level and Reading Stanines

Reading Stanine	Chapter								Average Score	Ability Level
	30	31	32	33	34	35	36	38		
8	2.3	3.0	2.3	1.5	4.0	4.0	3.0	1.0	2.64	Independent
7	3.5	3.7	4.0	3.3	3.5	3.3	2.0	1.0	3.04	Independent
6	1.7	2.0	2.3	2.0	3.0	1.3	--	--	2.05	Instruction
5	2.1	3.2	3.0	2.4	2.3	2.7	2.7	--	2.30	Instruction
4	1.7	3.0	3.3	2.5	2.3	3.0	2.0	.7	2.23	Instruction
3	2.0	3.0	3.3	3.0	3.0	2.3	--	--	2.40	Frustrated

Appendix GG

Pretest and Posttest Achievement Levels and Reading Stanines

Appendix GG

Pretest and Posttest Achievement Levels and Reading Stanine

Reading Stanine	PreTest Results by Chapter								Average Score *
	30	31	32	33	34	35	36	38	
8	72.0	52.7	41.3	68.0	78.7	69.0	50.0	62.0	61.7
7	62.5	61.5	48.0	64.0	78.7	55.5	56.5	52.7	59.9
6	45.0	43.0	38.0	49.0	56.8	47.3	35.5	36.0	43.8
5	54.4	64.3	49.5	60.3	70.3	58.3	46.0	54.9	57.3
4	32.5	59.3	55.0	62.5	51.5	47.5	48.0	59.5	60.0
3	31.7	58.3	62.0	54.7	62.0	45.0	32.0	62.3	51.1

Reading Stanine	Posttest Results by Chapter								Average Score *
	30	31	32	33	34	35	36	38	
8	51.7	86.0	53.3	66.7	73.3	62.0	52.0	68.7	64.3
7	58.8	80.3	53.3	63.0	80.0	65.0	57.8	71.3	66.2
6	28.8	57.0	43.5	61.0	46.5	43.0	37.3	45.0	45.3
5	49.4	80.3	55.8	58.6	64.5	55.3	45.1	63.4	59.1
4	41.7	70.0	57.0	60.8	58.0	60.5	46.0	67.0	57.6
3	55.0	84.3	64.0	53.0	63.0	51.0	31.0	64.0	58.1

* Calculations based upon 100 percent and actual student scores.